THE OUTLINES OF MILITARY GEOGRAPHY

COLONEL A. C. MACDONNELL

UNIVERSITY OF CALIFORNIA
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THE OUTLINES OF MILITARY GEOGRAPHY

BY

COLONEL A. C. MACDONNELL

LATE ROYAL ENGINEERS

FELLOW OF THE ROYAL GEOGRAPHICAL SOCIETY; ASSOCIATE OF THE INSTITUTE OF ELECTRICAL ENGINEERS; FORMERLY DEPUTY ASSISTANT ADJUTANT-GENERAL FOR INSTRUCTION IN INDIA; AND INSTRUCTOR IN SURVEYING AT THE SCHOOL OF MILITARY ENGINEERING

WITH NINETEEN MAPS

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PREFACE

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IN putting forward these "Outlines of Military Geography" I am deeply conscious of its many imperfections and the difficulty of satisfying the requirements of all classes of students by either not giving enough or giving too much information.

I have endeavoured, therefore, to give a sufficient outline of each of those countries which possess a special interest for Great Britain, to enable the ordinary reader to grasp the more important points of military geography, without which he cannot pursue his further studies in military strategy and history with an intelligent interest.

At the commencement of my own military career I found myself studying history and strategy for a long time with a very perfunctory geographical knowledge of the theatres of war I was reading about, and it was many years before I discovered my mistake. I know now that these subjects would have impressed them-

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selves very much quicker and more clearly on my mind had I first made myself acquainted with the nature and number of the important geographical features in each country, their relative positions, names, and military attributes. Such a knowledge would have broadened my military horizon much earlier and enabled me to understand many things in strategy and history which long remained in a nebulous condition. I have endeavoured, therefore, in this work to avoid, as far as possible, introducing historical and strategical dissertations, which can afterwards be studied better by references to other military works dealing more fully with these subjects; but in a few cases I thought it necessary to refer very shortly to certain historical and strategical occasions in order to emphasise the military value of certain geographical features.

I have also avoided, as far as possible, entering into facts such as population, character of race, armaments, etc., which would entail a volume in itself; also the size and nature of personnel and matériel, which are more or less ephemeral, and which are better studied in special works devoted to such information.

Any strategic remarks I have made are purposely very brief, and are, of course, open to discussion; if I have succeeded in establishing the desire for the latter in the mind of the reader, together with a wish to increase his geographical knowledge from a military point of view, I shall be amply rewarded.

I acknowledge with thanks the assistance I have obtained from the works of the many authors referred to, and I am very grateful to the General Staff at the War Office for assistance in consulting and preparing maps, etc.; to the Navy League for permission to use their map (No. I.); to Colonel Sir T. Holdich, K.C.M.G., K.C.I.E., C.B., for reading over Chapter V. on India, etc.; and to Colonel J. Engelbregt (Dutch Army) for supplying me with information about Holland.

A. C. MACDONNELL,
Colonel.

SANDHURST,
FARNHAM,
Oct. 22, 1910.

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BOOKS CONSULTED

"Operations of War." Hamley. 1907.

"Introduction to Military Geography." Brigadier-General May. 1908.

"Romanes Lectures." Lord Curzon. 1907.

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"Geography." Lecture. H. J. Mackinder. 1909.

"The Valour of Ignorance." General Homer Lea. 1909.

"Canada and Canadian Defence." Major-General C. W. Robinson, C.B. 1910.

ERRATA

Page 53, line 17, for "Grandines" read "Gravelines."
,, ,, ,, 30, after "Hirson" insert "Givet, Longwy."
,, ,, ,, ,, for "both" read "all."
,, 54, ,, 8, add after "invasion" "and it should be noted that there 8 large bridges over the Moselle between Treves and Thionville."
,, ,, ,, 27, after "Rheims" insert "Laon and La Fère."
,, ,, ,, ,, for "that" read "these."
,, 73 ,, 30, for "three" read "four."
,, 74, ,, 3, add after "frontier"—"and Thorn to Warsaw."
,, 76, ,, 25, for "three" read "four."
,, 87, ,, 22, for "Bulair" read "Tchataldja."
,, ,, ,, 27, for "4" read "14."

Map No. 1 is temporarily withdrawn.

The Outlines of Military Geography

CHAPTER I

INTRODUCTORY. SEA POWER. THE BALTIC

GEOGRAPHY has been defined as a subject which includes the study of the earth as a planet (from an astronomical point of view), the physical conformation of its surface, with its distribution of land and water, minerals, plants, and animals, as well as its diversities of climate, productions, peoples, and political divisions.

It appears a very wide field to range over, and yet military history assures us that every one of the geographical items above mentioned has played its respective part in campaigns of former and recent ages.

The actual essential geographical facts, however, are much reduced in number when viewed from a military point of view, but they are none the less all-important to a true appreciation of the art of war in campaigns either past, present, or future.

It is the appreciation of the extent and existence or non-existence of certain geographical features connected with a possible theatre of war, and their influence on military operations generally, which may be said to constitute the subject of *Military Geography*.

It is obvious to all that before considering any strategic possibilities of movements of military forces in any neighbourhood, you have to answer certain questions, such as, How are the forces to be moved to the place? How are they to be supplied? Where are the enemy's forces likely to be mobilised? What are his vulnerable points, and what is the nature of the intervening country? and others of a similar nature. These answers can only be correctly given after the country, with its communications, has been geographically studied from a military point of view.

Such a study, too, involves naval questions of great importance (especially for Great Britain), and the general policy of a campaign often entirely depends on the proper appreciation of geographical as well as political features, after weighing their respective merits from a military and naval point of view.

It will be seen, therefore, that the study is quite as important to the statesman responsible for the policy of a campaign as to the naval or military officer; but we know that in the past the study of military geography was even systematically neglected, and our political leaders have been known to land this country in great difficulties which might have been avoided had they previously studied this important subject. The past history of a country, too, must be studied in conjunction with that of existing geographical features, for valuable deductions may be made, for future guidance, from military operations either successful or unsuccessful in the past. For example, politicians used continually to assert that no power could move (in great force) from European Russia to the frontier of Afghanistan in less than a generation, yet the Russians won Caucasia in 1859 and reached Afghanistan only twenty-five years later. A knowledge of the history of the previous movements of armies over this country, combined with a study of that country's military geography, would probably have modified their false prophecies.

It is a notable thing, and indeed not surprising, that some of our ablest military commanders have been also great writers on military history, such as Cæsar, Marmont, Wolseley, Roberts, etc., and their writings invariably display a supreme knowledge and study of military geography.

Alexander the Great marched his victorious army from the Dardanelles to the Sutlej viâ Armenia, Persia, and Afghanistan, and took only ten days from the Oxus to the Indus: he not only accomplished this great feat, but he left on record in writing the only practical geography available for hundreds of years of the country he passed through.

Hannibal, Julius Cæsar, and, in more modern times, Marlborough, Napoleon, Wellington, Von Moltke, as well as our own great commanders of the present day, were all students of military geography.

Napoleon generally confined his studies to the countries he was operating in, but these he studied very deeply. It is said of him that during his campaign in North Italy (Marengo) he knew every geographical feature about the country far better than some of the inhabitants of it.

In considering, therefore, the subjects of military geography, military history, and strategy (which are so intimately allied), it would appear advisable to commence by studying the former, though, later on, the studies of all three must go hand in hand. At any rate a certain standard of knowledge in military geography should first be obtained, without which the studies of the others are very confusing.

In the following pages only an outline of the subject is intended to be put forward, and only countries dealt with which are likely to be of military interest to Great Britain.

THE SEA

The configuration of the sea determines the frontiers of Great Britain: its study for us is therefore of first-rate importance.

By reason of the sea, warlike operations with us must necessitate co-operation between naval and land forces.

It will be necessary, therefore, to study the characteristics of the sea around Great Britain and endeavour to make strategic deductions from them.

The map shows the scattered nature of the British possessions, but it also shows the sea in every case as the actual highway and primary link connecting those abroad to the mother country.

The sea surrounds Great Britain itself and cuts it off completely from its European neighbours and its colonies. We are therefore entirely dependent on the free use of the sea for communications of all kinds both in peace and war.

Notwithstanding this intimate dependence on the sea, many of our possessions oversea have immense land frontiers, bringing in their train the consequent responsibilities of government and defence and the necessity to study their military geography as possible theatres of war. Canada has 3,000 miles with the United States; India has nearly 6,000 miles of frontier with Persia, Afghanistan, Russia, Thibet, China, Siam, and France; in Africa there are 12,000 miles of land frontiers with France, Germany, Italy, Portugal, and Belgium.

Our responsibilities on land in varied and scattered parts of the Empire are very great, and are therefore more difficult to watch over and defend.

From the geographical positions of all these frontiers it is obvious that military operations of any size on land could not be carried on without support from the mother country, and therefore could not be carried on without command of the sea.[1]

Every one, however, should have a due appreciation of the circumstances under which command of the sea is essential and pre-eminent, and when it is that "command on land" becomes all-important, and the former dwindles into comparative temporary insignificance.

History is full of examples of periods when command of the sea was of the first importance, but the following periods appear to be especially illustrative of this—viz. 1757 to 1762, the despatch and landing of British infantry on the North Sea coast of Germany, and their prowess at the battle of Minden; the landing of British infantry in the Hooghly, and their defeating Surajah-ood-Dowlah; Admiral Hawkes' victory over the French in 1759; our successes in colonisation and military operations in North America, and naval successes both in the West Indies and the Mediterranean; British infantry landing at Lisbon and driving the Spanish out of Portugal.

Another illustrative period lies between 1778 and

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[1] The interdependence of the Sea and Land Forces is strongly emphasised by the whole history of the British Empire. (See Blue Book on the Imperial Conference. London, 1909.)

1782, viz. the contest of the American Colonies for independence, in which the command of the sea gave us at the commencement great advantages, until the arrival of the French Admiral, De Grasse, temporarily deprived us of them; also during this period our troops were fighting Hyder Ali and the Mahrattas in the very centre of the continent of India, and Gibraltar was saved.

Speaking generally, the policy of England during these periods is well summed up in Mahan's language:

"It was not by attempting great military operations on land, but by controlling the sea, and through the sea the world outside Europe, that both the first and second 'Pitt' ensured the triumph of their country in the two contests where either stood as the representative of the nation."[1]

We must not, however, fall into the error of concluding that Captain Mahan intended to assume that sea power alone is necessary at all times and in all places. Lord Esher points this out very ably in the following language:

"Any one familiar with the modern history of Europe would understand that when Captain Mahan in a fine passage says, 'Nelson's storm-tossed ships, upon which Napoleon had never looked, stood between him and the dominion of the world,' he never meant to imply or suggest that the rising of Europe after 1812 and the Coalition armies, and Wellington's tenacity in the Peninsular War were not quite as important factors in destroying Napoleon's supremacy in Europe as the British fleet.

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[1] Mahan, "Influence of Sea Power on the French Revolution, etc.," vol. ii., p. 402. 1892.

"In 1806—a year after Trafalgar—we were in complete command of the sea.

"The French and Spanish fleets were non-existent, yet Napoleon was at the height of his power after Jena, and practically master of the Continent.

"Suppose for a moment that the Treaty of Tilsit had remained operative, and that the Franco-Russian alliance had been maintained unbroken, of what avail would have been Nelson's victory or Collingwood's all-powerful fleet?

"We should have been forced to make peace, Belgium and Holland would have remained French possessions, slowly but surely we must have lost command of the sea, and the British Empire, commercially and politically, as we know it, would never have come into existence.

"The study of modern history suggests this commentary on the doctrines of the 'Blue Water School'—that sea power may be a decisive, but cannot be the sole, factor in determining the fate of a battle.

"Captain Mahan's thesis has been mischievously used to prove much more than he contended for. He has, for instance, never maintained that in the great wars for European independence against Louis XIV. and Napoleon, victory was achieved by sea power alone, and his volumes show clearly how much alive he is to the fact that in order to bring those wars to a final conclusion vast armies were required, which in numbers exceeded those of France.

"He would be the first to assert that for the national security of Great Britain, and for the safety of our vast heterogeneous Empire, a powerful navy is a necessity, but it is incredible that he would deny that a large military force for defence against aggression, and possibly to check the abnormal and dangerous growth of a hostile and competitive power, is no less a condition of our continued existence as a free people."[1]

The recent war in Manchuria is also illustrative of the influence of sea power, and has even been described as "amphibious," but it, like almost all the previous illustrations, emphasises the fact that successes can only be gained by a proper combination between naval and military forces, and the employment of proper proportions of each, varying according to time and circumstances.

Although instances could be cited where the contest apparently was confined to the land forces, it will be found in all cases that the influence of the command of the sea still made itself felt to a greater or lesser extent. We should have had a very different story to tell in South Africa in 1901 had we not possessed indisputable command of the sea at the time.

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[1] Lecture by the Right Hon. the Viscount Esher, G.C.V.O., K.C.B., to the Aldershot Military Society, January 15, 1907.

In the same way the course of the Russo-Japanese War would have been quite changed had the Russians been able to obtain command of the sea. Before the war actually broke out, the Japanese were prepared to answer two questions:

What is the first objective by sea for the naval forces?

What is the first objective by land for the land forces?

Owing to our similar insular geographical position it is incumbent upon Great Britain to have the answers to these questions also thoroughly thrashed out; and before this can be done an accurate and appreciative study of the military geography of the possible theatres of war, as well as their communications with the mother country, is absolutely essential.

It is obvious that the growth of sea power depends, firstly, on certain natural geographical features with which nature has endowed any particular country.

Secondly, it depends on the increase and prosperity of the country and its expansion beyond its boundaries.

Both these conditions are highly developed for Great Britain.

Its immediate frontier is composed entirely of sea, and it is placed directly on the great trade routes which lead to Northern Europe and which pass close to its defended ports. The protection of its own commerce and the attack of that belonging to others is greatly facilitated. Moreover, coal and iron are found close to the great ship-building centres—an asset of great importance from an economical point of view—and so long as the motive power of ships of war is dependent on coal, the quality of the latter is superior for fighting purposes to any to be found elsewhere.

While, therefore, Great Britain's Navy is supreme, any invasion becomes a matter of great difficulty, and the element of surprise may be argued to be eliminated.

NAVAL BASES

The time has unfortunately arrived when our supremacy at sea may, in the opinion of many competent to judge, be considered doubtful; under these circumstances strategists cannot avoid the study of situations which may be created in consequence.

This must lead to a careful comparison of the possible naval forces which may be brought against Great Britain in different parts of the world, and a true estimate must be made of the efficiency of such forces at different points. As the efficiency of a naval force is greatly affected by the number, nature, and geographical position of its naval bases it will be well to consider the principles on which they are established. It is not proposed here to go into these principles, but the following extract from General Homer Lea's book "The Valour of Ignorance" appears pregnant to a consideration of the subject:

"The efficiency of a fleet decreases or is augmented as the distance from its main base to the theatre of war is lengthened or diminished. The area of naval efficiency is determined by the multiplicity, dispersion, and efficiency of its naval bases. Without these depots a navy decreases in efficiency as it increases in size.

"Every naval base is the centre of a naval sphere of activity, the radii of which are determined by the steaming capacity of the fleets based upon it.

"A nation that wishes to be supreme in any ocean must be governed by the principle that the distance between its naval bases must never exceed the sum of the radii of any two of them.

"The security of naval bases rests fundamentally with their land defences. To depend upon the navy to protect its own bases in all emergencies is to reduce naval and military science to absurdity.

"To attempt the protection of naval bases by permanent batteries alone is only to be ignorant of the changes modern means of transportation have made in regard to the value of harbour defences. If once the enemy gains temporary command of the sea and at the same time possesses adequate transport fleets it will be able to seize every naval base by land attack unless prevented by mobile armies in their rear. Modern harbour fortifications consist of a series of detached batteries, and their only defence rests on armies equal in size and efficiency to any that an enemy may land adjacent to or distant from the harbours they intend to capture." (See page 149.)

SEABOARDS OF FRANCE, SPAIN, AND GERMANY

France has also quite a long seaboard from the Channel to the Mediterranean, but it is broken in two by the interposition of Spain; whilst we hold the most important strategical position on the line of communication by sea between these two portions. Moreover, the long land frontier of France has constantly obliged her to turn her attention inwards when she would have desired to devote herself entirely to strengthening her sea power.

Spain is a country which, with its long seaboard and geographical advantages, ought to be a great sea power, and indeed at one time it was so, but at the zenith of its power its colonies were badly governed and it neglected to keep up its naval supremacy. It fell a victim to its rising and more powerful neighbours, and contraction took the place of expansion, from which situation it has never since recovered.

Germany has a comparatively small seaboard, but it is especially favoured by the many navigable rivers which flow into the North Sea. The seaboard is also (like France) divided into two parts by the interposition of a foreign country—Denmark—but this is partly overcome by the construction of the Kiel Canal.

Germany has great supplies of coal and iron, and although the sources of these supplies are far inland compared to those of Great Britain, they are so placed as to be easily and economically conveyed by water. The climate of the Baltic region is not good, being cold and damp, and the nature of the coast-line is flat and shoaling. It is interesting to note that there is practically no tide in the Baltic, which converts it somewhat more into the nature of a great lake than a sea, and the proportion of salt in the water is almost nil; moreover, through a greater portion of the winter the sea is frozen and navigation impossible. All of which facts do not encourage the development of sea power.

On the other hand the extraordinary increase in the prosperity of Germany and her expansion outside her boundaries are encouraging her statesmen to overcome all difficulties and to develop her sea power to its utmost extent. It will be convenient here to consider therefore our geographical position regarding the North Sea and the Baltic, more especially taking into consideration our relations with Germany.

THE BALTIC AND THE NORTH SEA

Both the growth and neglect of navies in the last twenty years is a matter of extraordinary interest to us.

Japan, the United States of America, and Germany have all suddenly become first-class naval powers, whereas France and Russia have receded.

The more important pivots of our naval activity are consequently altered from the Mediterranean and the Channel to those in the North Sea: the geographical relations of the countries adjacent to these new pivots have therefore increased in military interest.

It is not intended to discuss naval strategic problems here, but it will be well to bear in mind that a portion of our fleet, complete in everything, has now been allocated to the North Sea and will be based on the Nore and Rosyth.

The Nore stands at the gate of the Capital and at the point of the greatest commercial concentration and dispersion in the United Kingdom, or indeed in the world; it is only 50 miles from Dover Straits, and 320 miles from Wilhelmshaven. Rosyth will not be completed till about 1918, and it is intended from there to control all commerce passing out of the North Sea to the north. Cromarty in the Moray Firth possesses great natural advantages as a naval port and is better situated than Rosyth for controlling the north about commerce, but Rosyth is the recognised base with dockyards, etc.

Dover, with its new harbour of refuge, has been made a base for torpedo boats and destroyers, thus guarding the narrow waters of the Straits.

It will thus be seen that though time may alter the balance of international powers both on land and on sea it cannot alter the fact that the geographical position of Great Britain gives her absolute control over the maritime communications of Germany, and that the larger the mercantile marine of the latter increases, the more this control becomes of increased importance to both countries, and Germany cannot get rid of it except by the entire subjugation of Great Britain. The extreme possibility of Germany ever undertaking such a task has been much discussed of late; it will be of interest therefore to note the geographical features of the states connected with the seaboards of the Baltic and North Sea.

The entrances into the Baltic through the Sound and the Great and Little Belts are practically in the hands of Denmark (see Map VI.). The narrowest part of the Sound is only 2½ miles across, but it opens out to 17 miles just opposite

Copenhagen, which is strongly fortified on both land and sea fronts. The central passage (by the Great Belt) narrows to about 7 miles in the Langeland Belt and to about 19 miles off the German island of Fehmern.

The Great Belt is the only entrance that will admit of the passage of modern battleships.

The Sound will admit of vessels of 23 feet draught in the correct channel (of which there are two) and the Little Belt of vessels of 24 feet draught.

Germany took Schleswig-Holstein from Denmark in 1864, and thus secured her communication between the Baltic and the North Sea by the Kiel Canal and made herself independent of the Danish entrance.

Denmark's political position, however, must always be a difficult one, as she does not enjoy the benefit of a recognised neutrality like Belgium. During the Crimean War it was with great difficulty she avoided a breach of neutrality with regard to the allied fleets of England and France operating against Russia in the Baltic.

Two international treaties were signed in 1908 of some importance. The first was signed by Russia, Germany, Denmark, and Sweden, agreeing to mutually recognise in the future the territorial *status quo* along the shores of these countries in the Baltic; and the second was signed by Great Britain, France, Germany, Denmark, Sweden, and

Holland, agreeing mutually to recognise in the future the territorial *status quo* along the shores of these countries in the North Sea.

These treaties, while respected, may be taken to mean that none of these countries will aggressively interfere with or invade the territories of the others; but it is doubtful if it precludes any of these countries from instituting new naval bases within their own territories. In this connection it was rumoured in 1908 that Russia intended to fortify the Aland Islands, which lie at the entrance to the Gulf of Bothnia, in direct contravention of an agreement made by the Czar at the conclusion of the Crimean War. A naval base or fortifications on the Aland Islands, would be a menace to both Sweden and Germany and indirectly affect the position of England. The rumour, however, has died away, and the two treaties referred to have since been signed; so it may be gathered that any project of the kind which Russia may have entertained has since been abandoned. Moreover, Russia's new naval programme has since been formulated,[1] and it provides for a new naval base at Kronstadt only.

Germany's North Sea littoral is emphasised by the three rivers, the Ems, the Weser, and the Elbe. (See Map VI.)

Wilhelmshaven will eventually become the chief naval centre of the German Navy, as soon as its harbour is deepened to take the largest ships.

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[1] See *The Times*, March 31, 1910.

Cuxhaven, guarding the approaches to Hamburg, is very strongly fortified, and the head quarters of the German Mining Divisions of the Navy.

Emden and Bremerhaven are marked down as torpedo-boat bases. A small but shallow canal connects Emden and Wilhelmshaven.

Brunsbüttel, at the North Sea entrance to the Kiel Canal, will eventually become a first-class repairing base. This new base is designed to strengthen the strategic position of the German fleet in the North Sea. The works will extend over the area south of the Kiel Canal from the Brunsbüttel locks to the village of Kuden-See. The choice of the location, which is immediately adjacent to the mouth of the Elbe, enables it to be defended by the defensive works already in existence for defending the mouth of the Canal, and takes advantage of the fact that the high seas are 23 miles distant. An anchorage harbour with room for the largest ships of the fleet will be created here with a depth of 37 feet. At Ostermoor on the Canal itself a special torpedo-boat harbour and dock will be located.

On the Baltic, Kiel is the chief naval centre, and is probably the best equipped naval station in the world. In addition to the extensive

Imperial yards, the town contains the great private establishments of the Krupp and Howaldt companies.

Dantzig is a secondary naval base. Shipbuilding and docks are also existing under private firms at Hamburg, Stettin, and Bremen.

The Kiel (or Kaiser-William) Canal, however, is the great strategic asset of the German Navy enabling a concentration to be effected in either the Baltic or the North Sea through German territory. It is 57 miles long and is now being widened to 144 feet, and deepened to 36 feet, the work to be completed in 1914.

It is evident, therefore, that Germany is making a great struggle against the geographical obstacles which stand in the way of developing her naval bases on the North Sea, and enough has been said to enable the reader to consider the problems of invasion and defence, which in this case are more of a naval than military character.

CHAPTER II

GENERAL CONSIDERATIONS AFFECTING THE SELECTION OF A THEATRE OF WAR

WHEN war breaks out between two countries, the selection of the theatre of war has to be made by that government which has the advantage of instituting the initial offensive movements. In the case of Great Britain, with her frontiers and dependencies scattered everywhere over the globe, a state of war may be declared against her either by one of the lesser powers or by one of the greater powers. In the first case it is possible that time may not be so vital, and even when attacked in one place it may be possible to change the theatre of war to another with advantage.

This was done by the Allies in the war with Russia (1854), in removing the theatre of war from Turkey to the Crimea. It was also partly carried out in the South African War (1900) by the change of pushing the principal offensive movements into the Orange River Colony instead of into Natal.

Should one of the Great Powers attack Great Britain's possessions it is conceivable, in self-defence of those possessions, that she may have no choice in the selection of the theatre of war, and may have to accept what is forced upon her, even though she may endeavour to make a diversion elsewhere.

When, however, the selection can be made, the first considerations are usually political; and here a real danger always arises that the political may obscure the strategical, especially in a democratic country. The strategical considerations will be found to be governed largely by the facts of military geography.

For Great Britain its first action must be the selection of sea bases favourably placed for future operations inland, good harbour accommodation capable of defence, and many other points which geography alone can demonstrate; then the nature of the theatre of war itself, with an appreciation of its railway and other communications, its topography, frontier configuration, strategical objectives, and other military characteristics.

A great responsibility lies with the statesmen responsible for the government of the country, and with whom this selection must rest: however, the teaching of military history shows that it is now better understood that the government, having given the original impulse and direction to a campaign, will do wisely to leave its further conduct in the hands of the military commanders.

The first or natural features that have therefore to be considered in a country where operations are contemplated are its mountains, plains, valleys, rivers, deserts, marshes, woods, climate, seasons, temperature, rainfall, resources, cultivation, and health and sickness.

In addition to these, the formation of the frontiers, fortresses, communications by road, rail, canals, rivers, and telegraph, the proximity of naval ports and coaling-stations, and the political condition of neighbouring states.

MOUNTAINS

Mountains always appeal more to the imagination as a military obstacle than any other military feature, but history is full of instances where they have been utilised successfully by the offensive or defensive armies. They may either lie parallel to the line of advance or lie across it, or the whole theatre may be mountainous, and each of these conditions will affect the composition of the forces and the strategy of the campaign.

In any case an intimate knowledge of the ground (maps, etc.) is here of much greater importance. The points to study in considering the mountains of any country are the general direction of the watershed lines, the number and nature of the passes and the character of the approaches to them, their general steepness, height above sea-level, height of snow-line (if any), and the seasons for rain or drought, extreme heat or cold.

Strategic considerations of mountains and other obstacles are fully dealt with in other works; it will therefore only be necessary to refer briefly to any historical instances which illustrate the impressions which geographical features have made on operations in the past, and which they are likely, therefore, to repeat in the future.

Napoleon's object in 1800 was to strike the right flank of the Austrian line of communications which extended from the French Alps (eastward and rearward) to Mantua and Verona (see Map VI.). It is a remarkable thing, but the roads here along this line are compressed into a narrow kind of neck between Milan and Piacenza only 40 miles wide. To carry out Napoleon's object the Alps had to be crossed in spite of their rugged and difficult passes. He passed the whole of his force by the Great St. Bernard Pass successfully and was at Milan before the Austrians realised the situation.

The Erzgebirge and the Riesingebirge, lying between Saxony, Silesia, and Bohemia, have played a conspicuous part in military history. The Prussians passed them in 1757 (see Hamley, page 238), and again in 1866, and the Allies (Prussia and Russia) in 1813 (see Hamley, page 278).

One of the most remarkable examples of an army crossing mountains is that performed by the Chinese, who, with 70,000 men, crossed the Himalayas into Nepaul with complete success, having previously marched over 800 miles from their own frontier, of which about half that distance was in mountainous regions at over 10,000 feet elevation.

The difficulties attendant on military operations in mountainous regions have been well exemplified in the British Thibet Expedition of 1905 under General Sir J. R. Macdonald and the many others undertaken in the north-west frontier of India.

In the former it was not foreseen that the troops would have the greatest difficulty in cooking meat or hard grain, as the elevation of the theatre of war lay so high that water boiled at as low a temperature as 180° F., which is not high enough to cook this kind of food.

The mountain ranges hitherto referred to have principally affected operations in the past as direct obstacles or barriers, but if they run longitudinally or parallel to the general line of operations they also influence strategy.

The Riesingebirge, in the 1866 campaign, divided Moltke's advance against the Austrians, and was the cause of anxiety to him; on the other hand the situation of the Blue Ridge and the Alleghany Mountains were fully taken advantage of in the Virginia campaign (1861) by Jackson, whose bold action and accurate knowledge of the country enabled him to act to his front along the Shenandoah Valley or to menace the flank of any advance from Washington towards Richmond on the east of the mountains.

Where the whole theatre of the war is mountainous the character of the fighting becomes greatly altered; for success, greater exercise of skill, local geographical knowledge, and appreciation of the powers of the troops to overcome or take advantage of the natural difficulties of the ground are required. The value of all possible routes, large and small, becomes acutely pronounced.

The Caucasus for fifty years (middle of eighteenth century) proved an insuperable barrier to Russia's advance on India, but here the inhabitants of the country were themselves fighting against the invader. This latter is a point of great importance.

The Tirah Expedition of 1896 affords an example of a successful campaign carried on in one of the most difficult countries in the world against most stubborn inhabitants.

The Chitral Expedition of 1895 and the Thibet Expedition of 1905 are some of the most prominent illustrations within our own experiences of mountain warfare and its attendant difficulties of organisation, equipment, and transport.

RIVERS

Rivers, like mountains, are military obstacles, and may be parallel to or across a possible line of operations.

Their effect on strategy is therefore somewhat similar, but in the case of mountains the crossings are generally limited definitely to certain points, whereas on rivers they are not limited to the same extent, and, moreover, the ground in the neighbourhood of rivers is more likely to enable the attacking force to bring effective covering power to bear in support of the crossing. On the other hand the existence of lateral communications along a river is more probable than between passes of mountains; hence a force defending the passage of a river has less chance of the unexpected appearance of the enemy on its flanks or rear. Roads also are generally more numerous, and the more numerous the practical avenues, the greater the difficulties of the defence; for either some must be left unguarded, or the army must lie spread over a larger front.

There are, however, so many special characteristics connected with any particular river that it is essential to take each one of them into account in order to appreciate their combined effect on military operations.

They are as follows: the relative positions of the strategic points of the country with reference to its course; length and tributaries; how far navigable; the crossings and their characteristics, including bridges, fords, and ferries, also the communications to them; rapidity of flow and width at different points; shoals, rapids, and cataracts; gorges and canals connected with them, general character of floods; probable frequency and height to which water rises; command of one bank over another; and the existence of important islands.

The Danube, the Rhine, and the Po have given innumerable illustrations in military history of rivers as obstacles, but their defence, like that of mountains, has not been successful for any length of time, though as a source of delay they are almost invariably successful; for this reason they are invaluable from a tactical point of view, guarding the flank of a march or a position, or exposing the advance of an enemy to an effective fire when attacking.

Strategically a river may determine the line of operations, as was done by the Nile Expedition (moving to the relief of Gordon) in 1885.

When a river lies parallel to the line of operations it becomes of special importance from the influence it may have on the strategical and tactical operations during the advance; but secondly, if navigable, from the secured advantage it gives to supply. Traffic does not become congested or be liable to blocking as it is on roads and railways.

Frederick the Great utilised the Elbe, and Moltke, in 1870, the Rhine. The Federals utilised the Mississippi in the American War, and Burgoyne the Hudson when advancing towards Albany.[1]

The Red River Expedition (1870) was remarkable as one where water transport was almost entirely depended on, both for personnel and supply, and also almost unparalleled by the fact that the troops themselves had to work their own transport. Starting from Toronto and utilising the Canadian Lakes, the River Winnipeg, and the Red River, it covered about 1,100 miles successfully under the most trying circumstances of weather and difficulties of supply. In those days the country was wild and almost unknown. Roads were non-existent, and the white population could be counted only by hundreds. There is hardly a single quarter of the globe which has made such vast strides in progress as this in the last forty years, and it is a matter of great interest to study the map and observe what a network of railways now lies over and around the Red River region, which so recently entailed such strenuous efforts to reach with a small expeditionary force. (See Map XVIII.)

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[1] Sir G. O. Trevelyan, Bart., "The American Revolution," part iii., p. 174. Longmans, Green, & Co., 1907.

A very interesting account of this expedition has been published, entitled "A Narrative of the Red River Expedition," by Field-Marshal Lord Wolseley, K.P.

Rivers may also be of great importance which, though not lying parallel to the original line of advance, may, when reached, secure a new line of communication.

Napoleon, in 1813, advancing from the Rhine into Northern Germany, reached the Elbe and utilised it as a new line of communication to the sea. (See Map VI. and Hamley, page 275.)

The Peninsular Campaign affords many examples of the uses to which the Douro and its tributaries were turned, but, except for a short distance in Portugal which Wellington took advantage of, they were of little use for the transport of supplies.

The Japanese, in their recent war against Russia (1904), took advantage of the navigability of the Amur and organised an expedition up it, which, had not peace been declared, might have had far-reaching results; for it not only threatened the Russians at Harbin, but, if successful, would have assisted in isolating the Russian maritime province of Ussuri. (See Map XI.)

When two or more rivers converge and run parallel to the line of advance the strategical problem becomes very complicated, and in order to understand this every student of war should study the campaign of 1814 in Champagne. It is fully detailed in Chapter V., Hamley's "Operations of War," 1907 edition. Here the Allies were advancing from the east on Paris as a strategic centre to which the three rivers, the Seine, the Aube, and the Maine all flowed in the direction of the advance (see Map IV.). This presents a considerable difficulty to the assailant whose forces get split up by the rivers and may offer many opportunities of being attacked with advantage. This campaign, as described by Hamley,[1] is so interesting that it is worth while to quote what is said about it: "So various are the lessons conveyed by this campaign that the reader who has mastered it must be competent to investigate almost any problem which strategy can offer. And he will doubtless be somewhat surprised to find how great is the importance of obstacles of the kind discussed in this chapter, for their influence is by no means obvious at first sight."

The study of rivers converging is important, as it is natural for a commander first to establish himself on the higher ground, from which the rivers must flow outwards, and he then gives himself the same problem as the Allies.

Napoleon established himself about Madrid (Peninsular Campaign, 1808), which is situated on the central and elevated plateau of Spain, and from which emanate the basins of the Douro, the Tagus, and the Guadiana.

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[1] Hamley, "Operations of War," p. 306. 1907.

DESERTS AND SWAMPS

Deserts, like mountains, have always stood in the paths of military invaders as obstacles of a serious character, but the advance of civilisation and the construction of railways tend to make these obstacles far less formidable now than in the past. For strategic purposes, however, they must still be seriously considered.

The Great Scinde Desert (see Map XIV.), situated to the east of the Indus, still lies before an invader who succeeds in reaching as far as Sukkur or Kandahar, and the desert lying to the south of the latter place and the Helmund, in combination with the desert to the west of Seistan (the Lut Desert), all tend to prevent any line of invasion being selected to the south of these areas.

North of the Lut Desert we find the Great Salt Desert, and these two practically shut off Eastern from Western Persia. These deserts become a factor of importance in considering either the advance of Russia towards India or towards the Persian Gulf (see Chapter V.).

The desert in the Sinai Peninsula (see Map XVI.) becomes an obstacle of great importance to an invader of Egypt by land from the east. This will be dealt with more fully later (see pages 104 and 106, Chapter IV.).

The Nile is flanked on the west by the Great Libyan Desert, and on the east by the Arabian and Nubian Deserts.

The Kalahari Desert (see Map IX.) acts as a protection to the Transvaal against incursions from German South-West Africa.

The antidote to deserts, however, as a military obstacle to invasion, is the construction of railways, and we ourselves have shown how they can be constructed and utilised in war, by Lord Kitchener's advance to Khartoum in 1895, when some 500 miles of military railway were constructed at an average rate of two miles a day. The Ruk-Sibi railway (130 miles) was also constructed, on the 5 feet 6 inches gauge, at a rate of two miles a day, in 1878.

It is worth noting here (see Map XIV.) that there are advocates for extending the railway from Nushki in Baluchistan across the desert to Nasirabad in Seistan (or westwards to Koh-i-Malik Siah), and eventually linking this up with some port like Bandar Abbas in the Straits of Ormuz, or Bushire in the Persian Gulf. Such a line, it is suggested, would be of strategic importance to us in the event of a Russian advance from Kushk and Herat (see also page 183).

CLIMATE AND SEASONS

The climate and seasons of a theatre of war are quite as important subjects of consideration for strategy as the physical features. Winter and summer, extreme heat or cold, the influence of rain, snow, frost, and haze, and the shortness or length of daylight hours have all recorded their mark in military history.

The Russians, crossing the Balkans in December 1877, lost 8,000 men through extreme cold.

The nature of the roads about Waterloo in June 1815, were turned into quagmires by a day's steady rain, and this fact had a serious effect on the plans of Grouchy, Napoleon, and Blücher.

During Lord Roberts' march from Kandahar to Kabul the variations of temperature between day and night were as much as 80° and were most trying to the troops, who had to carry the same clothes whether the temperature was at freezing-point at dawn or at 110° at mid-day.

At Inkerman in 1855, and at Albuera in 1811, mist and haze played a most important part.

Frost enabled the French army to overrun Holland, and the French cavalry and horse artillery to capture the Dutch fleet at the Texel in 1795; on the other hand Marshal Luxembourg took advantage of the ice to invade Holland in 1672, but a sudden thaw compelled him to retire.

The possibility of large forces crossing the St. Lawrence when frozen is an important strategic consideration in the defence of Canada.

The sanitary aspect of military operations, it is needless to point out, is of the first importance.

Almost every campaign adds to our experience for the necessity of adequate preparations beforehand in combating the accidents of climate, disease, and weather. This can be accomplished by organisation, and there are few campaigns which exemplify this so well as the Russo-Japanese War of 1904.

Lord Roberts' march already cited, however, was a notable example of our own good work; but if we go back to the Walcheren Expedition of 1809, and the Crimea (1855), we find the other side of the medal.

FRONTIERS

To study the configuration of frontiers it is impossible to ignore their history and the changes and vicissitudes and past struggles connected with them.

Frontiers and boundaries have been the chief sources of differences between nations for centuries, but as years pass on, and more intimate scientific knowledge of the formerly unmapped parts of the world is obtained, there is at any rate less chance of dispute over parts that were formerly only indefinitely marked out.

In Europe, frontiers, though well known, were constantly changing, and their various changes are intimately connected with military history, and afford a study of immense interest; it is not, however, proposed here to go into such a vast subject, but to consider frontiers as they are now, and how they may affect military operations in the near future.

In olden times it was not uncommon for great commanders to march as conquerors with large bodies of men half across Asia or Europe and back again; but telegraphs, railways, and steamships have so much improved the reception of early intelligence and facilities for movements of troops, that these kind of advances will be much more quickly and effectually opposed in modern times, and the struggles between nations will be found much more confined to the neighbourhood of the frontier of one or the other combatant.

It is evident, however, that, if two nations or countries have to utilise the sea in order to reach the other's frontier, no land attack is possible until the command of the sea is first obtained.

Still, circumstances may alter the above probabilities, as in the case of the Russo-Japanese War (1904–5), when Russia was actually occupying Chinese territory, and not her own. Japan here attacked Russia and defeated her, without the clash of arms once resounding in either Russian or Japanese territory.

Manchuria, however, is so evidently contiguous and important to Russia, that the study of Russia's frontier must practically include it.

Almost the first consideration connected with frontiers is the political status, both actual and probable, in the near future. It is not, however, proposed to enter into these considerations here, though they can never be forgotten. Before passing on, then, to the military aspects of frontiers, it is well to remind ourselves that Great Britain has the greatest extent of territorial frontier of any dominion on the globe (see page 5, Chapter I.).

These facts alone make us realise the importance and vital necessity of considering the military defences of our land frontiers at all times, and recognising the fact that these considerations are intimately bound up with the command of the sea.

Before studying frontiers from a military point of view it will be as well to mark special features or characteristics.

The selection of a theatre of war in proximity to a frontier, apart from political considerations, depends chiefly on the relative situation of the main objectives (other than the enemy's army), the nature of the country composing it, the positions possible for securing "immediate bases," the geometrical form of the frontier, the proximity and attitude of neighbouring states, and the number of, and facilities afforded by, railways, etc., for concentration and supply.

In the case of Germany invading France, her main objective must be Paris.

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In the case of an invasion of England the frontier would be the sea-coast, and the main objective probably would be London.

Except when advancing from one of our land frontiers in India or the Colonies, England would probably at first have to seize some point on the enemy's coast, which would be the first objective, but after that a main objective would have to be selected. This was exemplified in the Peninsular Campaign, when Wellington's main objective, based on Lisbon, was to strike the French line of communications somewhere between Bayonne and Madrid.

Capitals do not, therefore, necessarily become main objectives, though with a contest between the Great Powers they probably would become so.

The next consideration, the nature of the different areas of country on attracting or repelling operations, such as mountains, woods, deserts, etc., has already been dealt with. It is next advisable to consider the geometrical shape of the frontier, as to whether it is salient or re-entering or neither; the relative values of such shapes have been ably discussed in James' "Modern Stategy," and I make no apology for quoting his conclusions in his own words:

"1. On the whole the re-entrant shaped frontier is the more advantageous, because it enables the side possessing it to strike at the enemy's communications while protecting its own.

"2. To take advantage of the re-entrant shape the army using it must possess the power of debouching over it at properly situated points.

"3. The salient form of frontier confers the power on the offensive of debouching into the enemy's territory from either side, and enables a concentrated force to act by interior lines against the opponent, whose forces are split asunder by the salient.

"4. The salient form of frontier confers the power on the offensive of sometimes allowing a shorter route to the main objective than would otherwise be available, and one which gives a shorter line of communication through hostile territory.

"5. But when on the defensive the salient form offers the disadvantage (unless the salient is large and roomy) of not giving sufficient space to manœuvre a force of any size, which is then liable to the dangers run by one exposed to an attack.

"6. If the salient be of large size then it becomes a case of a double re-entrant.

"The Ulm Campaign, 1805, illustrates case 1, and the 1866 Campaign that of case 2.

"With regard to 3 and 4: Had we been able to advance from Natal in 1899, i.e. could we have taken advantage of the salient form of the frontier, we should have penetrated between the forces of the Transvaal and Orange Free States, and, operating from this direction against Pretoria, we should have had a materially shorter line of communication than we had from Cape Colony.

"The same campaign illustrates 5, for the small size of the salient in this case left us little or no manœuvring power on the defensive.

"Case No. 6 was illustrated in 1800, when the possession of Switzerland gave the French a large projection from their frontier, turning the Black Forest on the north and Western Piedmont on the south."

BUFFER STATES, ETC.

The neighbourhood of buffer states, existence of spheres of influence or interest, protectorates, or neutral zones close to frontiers must have an important bearing on all military operations connected with them.

A "buffer state" is an independent country lying between or adjacent to two others, and whose independence (guaranteed by treaty or otherwise) prevents invasion from either country without ample warning.

Switzerland, Bulgaria, Afghanistan, are all buffer states, but they differ considerably in character and importance as such.

The neutrality of a buffer state may be broken by itself or by its neighbour.

Switzerland, lying in the centre of so many powerful neighbours, and either between or on the flank of any operations between them, becomes of exceptional importance. For this reason each of the powers desires to maintain Switzerland's neutrality, and Switzerland herself recognises that her own existence depends on maintaining her own neutrality.

Switzerland has no foreign possessions or colonies: it is much to the advantage of each of the Great Powers, therefore, that she should be untouched and stand like a sentinel on a high point of vantage to be denied to all but tourists. Her neutrality was agreed to by eight powers in 1815.

Belgium was neutralised by five powers in 1831 (Austria, Russia, Prussia, France, and Great Britain). Luxembourg was similarly neutralised in 1867.

Bulgaria is now an independent state and physically presents an ideal buffer state, consisting essentially of the Balkan Mountains with their Russian and Turkish foregrounds, but its population differs in character from that in Switzerland, being of mixed and less civilised people, with an instinct to expand southwards. The country is divided in its feelings between Austria and Russia, but it is united in its hatred of the Turks. There are possibilities, therefore, of such a country not remaining neutral itself, and that it may even seek the assistance of Austria or Russia, in which case it may have to pay the price of this support and become either an Austrian or Russian province.

Abyssinia has had its integrity guaranteed by Britain, France, and Italy.

Non-political interference with Thibet has been guaranteed by the Convention of Peking of 1906, and by the Anglo-Russian Convention of 1907. Both powers in the latter case recognise the suzerainty of China and agree to maintain its territorial integrity.

Nepal, Sikkim, Bhutan, and the Upper Shan States on the Indian frontier have their foreign relations controlled by Great Britain.

Afghanistan is a buffer state of the first importance to India, and will be referred to more especially later on.

The above Anglo-Russian Convention of 1907 also sets forth a mutual agreement between the two countries on the following points:

(1) To respect the integrity and independence of Persia.

(2) Great Britain not to seek nor support concessions of a political or commercial relation beyond a line starting from Kasr-i-Shirin through Ispahan, Yezd, Kakhk, and ending at a point on the Persian frontier at the intersection of the Russian and Afghan frontiers. (See Map XVI.)

(3) Russia not to seek nor support similar concessions beyond a line from the Afghan

frontier by way of Gazik, Birjand, Kerman, and ending at Bandar Abbas.

(4) The region between these lines to be open to both countries.

(5) That Russia recognises Afghanistan as outside its sphere of influence and that its political relations will be conducted with Afghanistan through His Britannic Majesty's Government, except in purely local matters.

(6) Great Britain not to interfere in the internal government of Afghanistan, nor to annex nor occupy any portion of Afghanistan in contravention of the Cabul Treaty of 1905 with Abdur Rahman, provided the Ameer fulfils the engagements contracted under that treaty.

The agreement between Great Britain and Japan of August 12, 1905, is of even greater importance than the Anglo-Russian agreement just referred to.

The chief importance in it lies in the fact that it refers to the maintenance of the territorial rights of both powers in both Eastern Asia and India, and also to the common interests of all powers in China by guaranteeing the integrity of the Chinese Empire.

If by reason of unprovoked attack or aggressive action on the part of any other power either party to the agreement should be involved in war in defence of its territorial rights or special interests, the other party will come to its assistance. Great

Britain recognises the paramountcy of Japan in Korea, and Japan recognises the special interests of Great Britain in all that concerns the security of the Indian frontier.

Wakhan (see Map XIV.), a narrow strip of territory, in some parts only a few miles in width, and containing the upper waters of the Oxus, was handed over to the Ameer of Afghanistan by the Convention of 1895, and as long as the Ameer can maintain order there it forms a buffer zone between the Pamirs frontier of Russia and the Hindu Kush frontier of the Indian Empire.

Another form of creation of a buffer state is adopted by the Greater Powers in establishing "protectorates."

Russia protects Khiva and Bokhara, and broke down in its attempt to incorporate Manchuria and Korea: the latter has now become a part of the Japanese Empire.

The Indian Empire has been formed by a policy of protectorates.

British Somaliland Protectorate was acquired in order to safeguard the food-supply of Aden, and protectorates of petty Arab chiefships on the southern shores of the Persian Gulf established in order to prevent slave-raiding on the adjoining seas. (See Map XIII.)

France protects Tunis, Annam, and Cambodia. (See Maps IX. and XVII.)

Protectorates are also a familiar expedient in the partition of Africa, although the phrase more commonly applied in those regions is the less precise definition of a "sphere of influence."

A sphere of influence is a less developed form of extending a frontier than a protectorate, but it is more developed than a "sphere of interest."

The form of protectorate assumed by the United States of America over the Latin States of Central and South America is of great importance. It is better known as the Monroe Doctrine, and appears to involve a territorial guarantee of the states in question against any European power; but what measure of internal control or interference it may be held to justify it is difficult to say.

The theory of "hinterland" is another modern application of the doctrine of spheres of influence, resting the case for the advance of a frontier on the ground of territorial continuity. It is generally understood now that the actual extent of hinterland that is held to belong to any power depends upon the degree to which it succeeds in rendering its authority effective in the interval before it is fixed by international agreement.

As instances of this, we have the dispute between Great Britain and Venezuela as to the latter's inland boundary; the provisions by which the Great Powers, when leasing naval bases on the coast of China, acquired at the same time an interior zone; and the difficulties which arose lately in defining the Hinterland of Aden, where Turkish troops were constantly encroaching upon the tribes within the British Protectorate.

Lastly we come to a form of frontier extension in the shape of "leases." In this manner the occupation of territory is obtained which is not intended as a rule to be temporary, but in this form may be obtained without hurting diplomatic susceptibilities. Quetta and Nushki have been taken from the Khan of Kelat on a quit-rent in perpetuity. Wei-hai-wei, Kowloon, and Kiao-chau have also been obtained in this manner. (See Map XVII.)

In considering their strategic values it must always be borne in mind that neutralisation of territory in the above form does not absolutely protect, and has in practice not protected, these countries from violation, but it renders aggression less likely by the possibility of it becoming an international issue.

Having considered the geometrical shape of a frontier and the situation of the neighbouring states, it is also necessary to consider the varying strategical situations that may occur, dependent on which country assumes the defensive.

It is not intended here to go into the respective advantages that may accrue to any country taking the offensive (which subject is fully dealt with in strategical books), but to draw attention to the fact that, in studying the geographical aspect of a frontier and its effect on military operations, it is necessary to study it in practically two ways, taking each separately—that is to say, assuming first one belligerent to have succeeded in concentrating on the frontier before the other, and then the opposite case.

There may be political or other reasons which might mark out one belligerent clearly as likely to act on the defensive, but it is safer to study the possible theatre of war from both aspects.

Previous to the Boer War of 1899 it was never contemplated that a defensive attitude would have to be assumed by the British force between the Tugela and Ladysmith, south of the Natal frontier.

The French in 1870 contemplated assuming the offensive, but through faulty concentration were forced to accept battle in their own country.

In oversea expeditions, such as is probable in the case of Great Britain, the possible extension of the base of operations is of importance; this is discussed in Chapter II. ("General Conclusions"), Part V., Hamley, 1907.

RAILWAYS, ROADS, AND WATERWAYS

The consideration of concentration on frontiers naturally leads to the study of railways, roads, and waterways, and their bearing on movements and supply.

It is assumed that the reader has already studied the strategic value of these systems of communication (Chapter III. Hamley's "Operations of War," and Chapter XIV. James' "Modern Strategy").

Each frontier can then be considered on its merits. It should, however, be remembered that existing railways can scarcely be counted as useful for movements of troops within the area of actual operations. Roads must always be used for the concentration of armies after arrival at the point of detrainment. From an English point of view railways will have to be considered under three aspects:

1. Concentration at ports of embarkation.
2. Concentration at ports of disembarkation for defence.
3. Use of railways in invaded countries.

The importance of the nature of the roads within the area of probable operations cannot be overlooked.

On June 17, 1815, Napoleon, marching from Ligny by the great paved "chaussées" of Namur and Brussels, assembled his army at Waterloo, during that evening having accomplished 17 miles. Grouchy, moving by country roads, had great difficulty in marching 5 miles to Gembloux in the same time.

Canals and waterways have in the past played important parts in facilitating supply, and even in the transport of troops; but where railways are existent or possible of construction the importance of the former must in future be much discounted.

In uncivilised countries, however, where large navigable rivers exist along the main line of approach, they naturally must always be of the first importance. In such expeditions as the Nile Campaign of 1885, and the Burmah Expedition to Mandalay, 1885, full use was made of the Nile and Irrawadi; but in the Franco-German War of 1870 the Rhine was comparatively little used, except for the collection of reserve supplies from Holland at Worms and Bingen.

The value of railways has become so great in assisting the assembly and supply of modern armies, that in future they must in many cases dictate the line of operations. The Russo-Japanese War (1904–5) is a case in point, where the operations were practically confined to the Mukden-Port Arthur railway.

Nevertheless, the existence or projection of such canals or waterways are of universal interest, such as the Suez, the Panama, and the Kiel Canals, must have very important influences on strategical operations undertaken by the powers connected with them. These will be dealt with in Chapter VII.; but it will be sufficient to remark here that their influence is principally naval not military, owing to the magnitude of the works enabling warships of large size to pass through them.

STRATEGICAL POINTS

Everywhere in a theatre of war will be found important and clearly defined points, the possession of which must obviously give a distinct strategical advantage to the holder.

Such places as the crossings and entrances of large rivers, mountain passes, defiles of all kinds, capitals of countries, harbours, arsenals, dockyards, railway junctions, and in Eastern climates water supply, can all become strategical points of great importance: their existence and strategical positions must be carefully studied.

Capitals usually become greater in importance with the magnitude of the powers engaged; for instance, Pretoria was made a strategical point in the South African War, but its fall or occupation could not make its importance anything like so great as the fall of Paris in 1871.

In spite of the great alterations in geographical distribution, improvements in arms, powers of movements, and means of communication, it will be found that many of the principal strategical points of former days must still retain their character in the future. Cologne and Mayence on the Rhine, Belgrade and the junctions of the

Save and the Drave on the Danube, Vienna, Constantinople, Paris and Montreal, Quebec and Kabul, have all played important parts in history, and are probably destined to do so again; but many minor strategical points compared to these must also be studied in considering military operations in any possible theatre of war.

CHAPTER III

LINES OF INVASION AND DEFENCE

FRANCE

(Map IV)

IN studying the land frontier of France it will be observed that there are about 200 miles of fairly straight frontier running south-east from Dunkirk separating it from Belgium before it reaches Germany. It runs nearly another 100 miles, still south-east, to a point about 40 miles due west of Strasburg on the Rhine, then south and south-south-west, fairly straight, to near Geneva, another 180 miles, where it turns sharp to the east for about 50 miles, and thence fairly straight to the south till it reaches the Mediterranean.

The principal physical obstacles along the north-east and eastern frontiers are the Ardennes and the Eifel, the Meuse, Moselle, and Rhine.

To the east there are the Moselle, the Vosges, the Rhine, and the Black Forest; to the south of that, Switzerland, and the Italian frontier with its formidable array of mountains.

The policy of defence adopted by the French has been to organise a line of forts and entrenched positions immediately behind this frontier line, which inherently does not lend itself easily to defence. It was considered inadvisable for political reasons (and also most undesirable) to relinquish to the enemy (by falling back to better lines) more French soil than was absolutely necessary.

It is not intended here to discuss the advantages or otherwise of this policy, but it cannot be ignored that these entrenched positions must absorb large numbers for their defence, and thus weaken the strategical defensive power of the field army, by which alone victory can be expected.

Commencing at Calais, we have this town fortified, together with Grandines, Dunkirk, and Bergues, and the country generally from the River Yser to the Lys capable of being put under considerable inundations.

Lille is strongly fortified and is the junction of a number of railway lines.

A central position for defence has been organised for this part of the frontier generally, more especially facing Charleroi, where many railways unite. Its right rests on Maubeuge (fortified) on the Sambre. It is intended that this position should menace any advance either east or west of it.

We next come to Hirson and Montmedy, both fortified, leaving a large gap in the line of forts-d'arrête, as Mezières on the Meuse, Givet, etc., are now no longer considered capable of effective defence.

The general line of defence on the eastern frontier extends along the line of the Meuse; but from Verdun northwards there is a gap left in the line of forts inviting invasion.

Verdun is practically an entrenched camp of the first class, and from this place southwards the line of the Meuse is defended by a line of forts of varying strength till we reach Toul, another first-class fortress, situated on the Moselle and on the Strasburg-Paris railway.

Between Toul and Epinal there is another gap in the line of forts; the line of the Moselle, however, lies along it. Epinal is another first-class entrenched camp extending itself on both banks of the Moselle.

From Epinal the line of defence extends along the left bank of the Moselle till it reaches the southern end of the Vosges Mountains, the interval being strengthened by a line of forts. The first-class fortress of Belfort guards the gap between the Vosges and the Jura Mountains.

Behind the gap to the north of Verdun we have Rheims, and behind that, between Toul and Epinal, we have the strong fortress of Langres.

Besançon, about 50 miles south of Belfort, and Dijon complete the defences along this frontier.

Paris itself is strengthened by a line of detached forts extending over a perimeter of between 80 and 90 miles long.

The principal railway centres along this frontier, commencing from the north, are St. Pol, Arras, Laon, Mezières, Rethel, Verdun, Bar-le-Duc, Neufchâteau, Mirecourt, Epinal, Vesoul, and Besançon.

In considering a probable line of invasion by Germany it is necessary to consider the probable attitude of Belgium.

The shortest line from Berlin to Paris passes through Cologne, Liége, and Namur. (See Map V.)

Any invasion of France by Germany along this line would mean the violation of Belgium neutrality, which, as has already been pointed out, is guaranteed by the five Great Powers.

Moreover, Belgium herself would probably resist such action, and as she has an army of about 180,000 men, it does not appear that the advantage of such a line of invasion would balance the disadvantages. In connection with this it is interesting to remember that in 1831 Clausewitz's plans included an attack on Belgium alone, as he considered, in default of allies, the task of attacking Belgium and France together was beyond the power of Prussia; and this was before Belgium's neutrality was guaranteed.

The neutrality of Switzerland and its possession of naturally difficult country, as well as its distance from the direct line of advance, practically precludes its violation on the part of Germany. (See Map VI.)

This limits the probable line of advance to the area extending from Luxembourg to Basle (see Map IV.), and this was the view taken by Von Moltke in 1869, the year before the Franco-Prussian War.

Along this area the chief natural obstacle to an invasion is the line of the Vosges Mountains, and as the gap between them and the Jura is so narrow and strongly guarded, it is again probable that Germany would have to select the more open gap between the Vosges and Luxembourg as her principal line of advance.

The Vosges in their southern portion form a serious obstacle to the movements of troops, for the main roads are few and guarded. Their greatest width is at Colmar about 42 miles, and west of Strasburg they begin rapidly to decline in height, and are penetrated by railways at Saverne, Bitche, and east of Zweibrucken (on the Saar). North of this latter place they lose their mountainous character and become merely a hilly region. They are parted from the Rhine by a broad flat valley, and the region is covered by important strategic railways centring on Strasburg, one of these running south along this valley (west of the Rhine) to Mulhausen: both the latter place and Colmar have railways running eastwards across the Rhine to Freiburg.

The details of railways on both sides of the frontier have not been gone into, as there is now such a network of them in all directions that all operations in any direction can practically have them at disposal.

Enough information has, however, been given to leave the strategic considerations to be taken up by the reader and to consider how far the line of fortresses and other obstacles, situated as they are, may affect the question.

The consideration of the advance of France against Germany can be better understood after discussing the defences of Germany, which will be dealt with later on.

There are some striking features connected with the South of France which are of considerable interest. (See Map IV.) In the south centre of France rises a comparatively barren plateau, averaging about 3,000 feet in height, with deep ravines and volcanic hills, formed by the Auvergne and Cevenne Mountains. This plateau slopes generally upwards from the north and from the west, arriving at a brink overlooking a deep depression lying between it and the Pyrenees. To the east of this plateau lies the valley of the Rhone, directed straight north from Marseilles and extending along the

Saone right up as far as the Langres Plat and Belfort.

The Pyrenees are a more continuous range than the Alps, and the passes are more difficult.

Along the whole distance of the Pyrenees it is unpierced by tunnels and only traversed by railways at the two ends near the sea. There are a few minor but difficult passes with carriage roads crossing the range; these lead south from Bayonne, St. Jean, Oloron, Luz, Arreau, Bagnères, Seix, Ax, Mont Louis, and Céret.

The city of Carcassonne stands on the watershed between the Mediterranean and the Bay of Biscay, and here we find a comparatively narrow defile between the plateau described and the Pyrenees. It is about 600 feet above sea-level and through it run the railway, canal, and road connecting the east and west. The River Garonne flows towards the Bay of Biscay, and the River Aude flows a shorter distance eastwards towards the Mediterranean.

At the end of the Peninsular War, after Wellington had secured Bayonne (1814), his main route to Paris (which the Allies were approaching from the east) passed through Bordeaux, Tours, and Orléans. With the object of drawing Wellington off this route, Soult retired eastwards on Toulouse. Wellington was bound to follow him, and here was fought the final battle of the campaign.

There is little doubt that the natural features of the "gate" of Carcassonne and the advantage offered by the protected and fertile valley of the Rhone as a better strategic line of retreat influenced Soult's decision.

Between France and Italy stand the French and Maritime Alps, and although there are over two hundred passages of various kinds crossing them, the following are the only passes fitted for wheeled traffic:

The Little St. Bernard (7,192 feet), Mont Cenis (6,772 feet), Genèvre, Col de la Madalena, Col di Tenda (6,009 feet), and La Corniche.

The Mont Cenis and that along the Mediterranean shore are the only railway connections.

Along the Maritime Alps the heads of the valleys on the French side are within the Italian frontier.

HOLLAND

(Map V)

Holland is vulnerable both by sea and land. Its shores from the Hook of Holland to Helder and in the Zuiderzee are, however, very shallow, sandy, and difficult for ships of any size to approach.

The two northern estuaries of the great river flowing into the North Sea, that at the Hook of Holland and the one immediately south of it (the Haringvliet), are the only openings which allow the passage of large warships into these rivers.

The only similar openings into the Zuiderzee are the North Sea Canal (from Ymuiden to Amsterdam) and the Marsdiep at Helder.

The Zuiderzee, however, itself is shallow, not admitting navigation of ships of more than 15 feet draught.

All these openings are strongly guarded by modern forts, the first two by Brielle and Hellevoetsluite on the island of Vorne, connected by a defensible dyke.

The Hollands Diep is defended by Numansdorf and Willemstadt on the north and south of it respectively, the North Sea Canal by forts at Ymuiden, and the Marsdiep by both land and sea forts at Helder.

An ordinary shallow navigable canal connects Amsterdam with the River Vecht and thence on to the River Maas (or Meuse).

The general policy of defence (which is that of armed neutrality) is to confine it eventually to the area of the country which lies below the level of the sea (see Map V.), retiring when forced from the provinces south of the River Maas and from the provinces east of Utrecht; then, by the use of inundations and fortified dykes, to form lines of defence based on Utrecht and Amsterdam.

On the east a preliminary line of defence from an eastern attack would be taken up along the River Yssel, and later along the River Grebbe, which, it is believed, would give sufficient time to let in the necessary inundations on the lines of water defence.

There are two lines of water defence, the first following the eastern edge of the country (shown on the map) below the sea-level. Its left rests on Naarden and Muiden on the Zuiderzee and runs due south past Utrecht to Asperen on the Linge, and thence to Gorinchem (or Gorkum) on the River Waal. Against a land attack from the south the four rivers, the Waal, the Maas, the Lower Rhine, and the Hollands Diep are alone sufficient to make a strong line of defence.

A second water line of defence runs from Muiden (on the Zuiderzee) to Weesp, Haarlem, Velsen, Uitgeest, and Edam (on the Zuiderzee), with Amsterdam in its centre strongly defended itself by inundations and forts.

It will be seen therefore that a purely passive defence is contemplated, but one which in the absence of a prolonged frost would entail great delay to an invader. Utrecht is the chief centre of the land defences, and, being strongly protected towards the south by the rivers, would almost preclude any attack by land from any direction except on the east; on the other hand the estuaries of the Maas might be forced by superior naval action and a base formed which would turn the first line of water defence.

GERMANY

(Maps V and VI)

Taking the western side of Germany first, the chief feature to be noticed is the comparatively straight line followed by the frontier while travelling south from the mouth of the River Ems till it reaches a point about 30 miles west of Basle on the Rhine. There is a slight deviation westwards where the Rhine enters Holland; it marches for about 30 miles with the Belgian frontier, then it touches Luxembourg, from the south of which it runs to the north end of the Vosges Mountains and then along the latter.

We see also the line of the Rhine running nearly parallel to that part of the frontier which lies along Belgium, Luxembourg, and France.

The Eifel Hills and the Ardennes lying to the west of Coblentz and the Vosges Mountains farther south form natural obstacles to military operations in front of the Rhine and the Black Forest behind it.

Below Liége the Meuse runs nearly from south to north and close along the western side of the Belgian-German frontier; it is here bordered with marshes and forms a natural line of defence for Belgium. Below Liége the railway crossings are at Maestricht, Maesdych, Ruremonde (6 miles north of), Venlo, and Gennep.

The Lower Rhine constitutes a formidable line of defence for Germany, with the Eifel Hills (2,500 feet) rising to the west of Coblentz.

Mountainous country lies between the Rhine and the Elbe, and is easy to defend; any invasion to avoid this country would either have to pass to the north by Hanover and Brunswick or advance by the valley of the Maine.

All the rivers between the Rhine and the Oder run to the north-west, also favouring the defence of North Germany from the west.

A German army placed in the centre, i.e. on the line Frankfort—Cassel—Magdeburg, would be in a most favourable position to manœuvre on the flanks of an enemy who tried to follow the lines suggested, or to defeat him in front if he tried to advance between these lines.

The valley of the Maine is the route which armies have used time after time coming from the west.

This valley pursues a very tortuous course, rendering it therefore more dangerous to the invader, and it will be observed it leads up to the gaps between the Erzgebirge and the Böhmer Wald (Bohemia Forest), but the gap leading from the valley of the Maine to that of the Elbe is held by the strong fortress of Eger (Austrian), just as the gap between the Vosges and the Jura is held by Belfort.

It will also be observed that the Thuringian Forest Hills (3,220 feet) continue the line of the

Böhmer Wald towards the north-west, and to the east of them lie the historic battlefields of Jena, Leipzig, and Dresden.

In South Germany the Black Forest is the chief feature east of the Rhine, with the Danube rising in it; flowing eastwards through Bavaria and close to its source also rises the Neckar, which turns north before it flows into the Rhine at Mannheim. The railway bridges crossing the Rhine are as follows:

Wesel (large entrenched camp), bridge 2,150 yards long.
Rheinhausen (Duisberg to Essen).
Hanun (Neuss to Dusseldorf).
Cologne, 460 yards long.
Coblentz, 370 yards long.
Mainz, 460 yards long.
Germersheim, 315 yards long.
Strasburg, 270 yards long.
Neu-Brisach, 230 yards long.
Neuenburg, 210 yards long.

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In addition to the above there are numerous bridges of boats.

The fortified places on the Rhine are: Cologne, Coblentz, Mainz, Rastatt, Strasburg, Neu-Brisach. There are also Metz and Diedenhofen on the French-Lorraine frontier and Bitche in the Vosges Hills between Hagenau and Sarguemines.

The junction of the Moselle and Rhine possesses a strong fortress (Ehrenbreitstein) on the east side of the river near Coblentz.

Mainz is recognised by the Germans as the most important strategic point on the frontier, and they have made it one of the strongest land fortresses in the world. It is situated on the most eastern elbow of the Rhine and completely commands its passage either for defence or offence at this point.

Mainz also commands three possible lines of invasion:

(1) The route of the Neckar, by which the basin of the Danube can be reached.

(2) The route of the Main, which leads to the valleys of the Saale and Elbe.

(3) The route of the Kinzig and the Nidda leading to Cassel or to the gate of the Thuringer Wald at Erfurt.

Cologne, Metz, and Strasburg are strongly entrenched camps, and taking into consideration their situation with reference to the frontier-line it is easily recognised that they are intended to cover the concentration of armies behind, with more security and greater offensive power than was effected in 1870, when Metz and Strasburg were in French territory.

It will be recognised that the natural and artificial features to which attention has been drawn give Germany great security from any attack from the west. It must also be remembered that the policy on the part of German defence here is purely offensive, and it is difficult to see why the arguments which Von Moltke employed in 1870 should not more than ever apply now. These are described fully in General Verdy du Vernois' book "With the Royal Headquarters" as follows:

"The main idea of Von Moltke's plan for the conduct of the war was to act on the offensive. With this end in view the massing of our troops had to be executed in such a manner that the war could be immediately carried into the enemy's country and in a direction which would ensure meeting his main body.

"Owing to its geographical position the German territory on the left bank of the Rhine, which projected far into France, seemed to the General the fittest place for concentrating our forces. An advance was possible from here in every direction, even if the French were not to respect the neutrality of Belgium and to march through that country. At the same time it was the best way of protecting South Germany, for if the French were to advance from Strasburg, possessing as we did the passages of the Rhine, we could meet them with superior forces on either bank of the river. Should they make the attempt to go through Baden and Würtemburg, such an undertaking could be easily checked on our part by an advance on the right bank which would cut their communications and involve them in a catastrophe in case of defeat."

Every effort is made, therefore, by Germany for perfecting concentration by superior mobilisation and the preparation of details for railway transport towards the frontier in peace time; and this policy stands out in marked contrast to that pursued by France, who, her frontier not possessing the same natural features for defence, considers it advisable to adopt a policy of establishing long lines of fortresses and entrenched positions.

SOUTH GERMANY

(Map VI)

When Vienna was the strategic objective of the French Campaign the basin of the Upper Danube (Ulm to Passau) was of great importance. The principal routes adopted were: (1) on the south, by Schaffhausen and so on to the Danube; (2) on the west, by the defiles of the Black Forest; (3) on the north-west, by the Warintz and Altmuhl rivers.

The first of these operations is, under present circumstances, not likely to be repeated; even if France violated the neutrality of Switzerland in order to turn the defences of the Rhine, she would be little nearer her objective (Berlin) than she is already at Belfort. Should there be, however, an alliance with Austria it would of course alter the circumstances entirely.

The strategic objects on the Upper Danube are Ulm and Ratisbon (Regensburg).

Ratisbon is at the northern angle of an elbow of the Danube and stands about 200 miles from both Strasburg and Vienna, and is within easy reach of the debouches from Bohemia and commands the communications between Bohemia and Bavaria; it is not, however, fortified.

Ingolstadt, standing about 50 miles higher up on the Danube, has been very strongly fortified, and the great arsenal of Augsburg is situated about 50 miles south-west of it.

The frontier of South Germany (Bavaria) runs fairly straight from Basle along the Rhine, Lake Constance (where it meets the Austrian frontier), and the Tyrolean Alps, till it turns north along the Salza and the Inn. It crosses the Danube at Passau and thence follows the line of the Böhmer Wald. The Austrian boundary continues from here along the mountains to the source of the Oder.

The configuration of this frontier gives a strategic advantage to Germany in an invasion by Austria, as a concentration in Bohemia by the latter exposes them to interruption from both Bavaria and Silesia. On the other hand, if Germany was occupied by allies of Austria elsewhere and could not make an energetic offence, the protuberant situation of Bohemia would give Austria a serious advantage. It is evident, therefore, that for strategic reasons alone the friendliness of Austria is of great importance to Germany.

In 1866 Germany was at first doubtful whether Austria would advance through Bohemia or through Silesia: in the event of a similar campaign, there is nothing to alter similar circumstances arising; but Germany has increased her network of railways so as to facilitate concentration along any point of the Austrian frontier, and trusts, as in the case of the western frontier, to superior mobilisation and offensive action.

There is now a double line of railway running as follows: Hof—Chemnitz—Dresden—Gorlitz—Liegnitz—Breslau—Myslowitz, which facilitates lateral movements of troops from Bavaria to Silesia, a point of great importance.

EAST GERMANY

(Map VI)

The chief characteristic of the country on the east of Germany is that mountains, and even hills of any considerable height, are conspicuous by their absence, and that well-marked rivers with marshy borders take their place. (See Map II.)

The Oder, Wartha, Vistula, Niemen, and Drina rivers all run north-west or north into the Baltic, and form successive obstacles to the advance of armies from either east or west.

The configuration of the frontier with Russia and Austria is also of a striking nature, as Poland (extending about 200 miles from north to south) lies sandwiched in between Austria on the south and East Prussia on the north. It will also be observed that the Vistula, rising in the Carpathians in Austria, forms the south frontier of Poland and, turning to the north, cuts right across Poland and East Prussia before reaching the Baltic.

The position of Silesia also is interesting, situated as it is between the Sudetic Mountains on the Austrian frontier and the wooded districts of Poland. It is a very rich country in agriculture, mines, and industries, and to it converge the main lines of communication of Bohemia, Moravia, Galicia, and Poland, and all the communications which unite Eastern and Western Europe pass through it. It is watered by the Oder, which rises in Moravia, comparatively close to the March river, which flows into the Danube at Presburg.

The line of the Carpathian Mountains runs inside the Austrian frontier with Russia, and is continued by the Transylvanian Alps to form the South Austrian frontier with Roumania.

Such a configuration therefore exposes Poland to invasion from three sides and, moreover, exposes any advance westwards by Russia through Poland to a descent from north or south on its line of communications.

As in the case of the western frontier, Germany's policy of defence is therefore dependent on offensive action.

At first sight it would appear that Russia's best primary objective in a war with Germany would be Silesia, or, if Austria were allied with Germany, Silesia and Bohemia. It is evident, however, that this strategy is countered by German forces concentrated in East Prussia and Austrian forces in Galicia.

The northern boundary of East Prussia, lying on the Baltic, combined with Germany's superiority in naval strength, adds to the security of concentration here from any possible interference from the north.

There are several well-marked parts of the country which, owing to their marshy and swampy nature, must be considered.

That part extending from the Pregel about 50 miles east of Konigsberg in a southerly direction up to the Russian frontier is swampy and marshy country, and also along the frontier between the Vistula and Wartha. To the south of this the frontier is marked at intervals by huge marshy forests. Here, also, the land is generally flat, marshy, or sandy, and all movements would be limited by roads which are particularly bad.

The chief points of strength are Konigsberg, Dantzig, Bromberg, Thorn, Posen, and Glogau.

Konigsberg is a strong fortress on a broken and wooded peninsula, of which the coast is steep and inaccessible, protected on the east by the Dieme Canal. The fortress of Pillau defends the entrance to the Frischer-Hof. To the north the entrance to the Kurischer-Hof is defended by very powerful works, but Memel itself is not fortified.

Dantzig is a first-rate fortress and entrenched camp, and is defended both from sea and land attacks. The branch of the Vistula on which it is situated is called the Mottlau.

Bromberg protects the railway bridges across the Netze.

Thorn is a most important strategic position on the Vistula, and enables German forces to operate on either bank of the river.

Posen is a large entrenched camp, and commands the eastern frontier generally. The Wartha here is about 100 yards broad, and the marsh country between it and Thorn protects its left flank.

Glogau is the only defence of the Upper Oder, and from here upwards the Oder is much more easily crossed.

The Oder forms a natural second line of defence, and the strategical defended points are Stettin and Kustrin.

Stettin has been very strongly fortified towards the sea. A canal runs out from it to its port, Swinemunde. It is 500 yards broad, and 7 or 8 fathoms deep. The harbour has 5 fathoms of water.

Kustrin stands at the junction of the Oder and Wartha rivers. The valleys of both these rivers are broad and marshy, and their passage difficult. Kustrin is strongly defended. Between the mouths of the Oder and Vistula are three coast-defence forts: Kolberg at the mouth of the Persante river, Rugenwalde at the mouth of the Wipper, and Stolpemunde at the mouth of the Stolpa. The estuaries of these little rivers might be utilised, if necessary, as points of disembarkation.

It is, however, in studying the railway system actually existing on this frontier that we see the strength of Germany, both for offence and defence.

There are two distinct lines of railways running east into East Prussia, with innumerable branches leading to all parts of the East Prussian boundary.

There are two, or sometimes three, separate lines running all round the frontier by Thorn, Posen, and Breslau; all connected many times over with Central Germany. Breslau itself has seven different railway lines running out of it, and the frontier between Breslau and Cracow is a perfect network of railways. It is evident, therefore, that rapid concentration along any point of the frontier is fully aimed at. There are only three lines of railways which actually cross the frontier, i.e. Konigsberg to Lomza, Dantzig to Warsaw, and Ratibor to Warsaw (on the Austrian frontier).

It may be noted here that the gauge of all railways in Europe is the same, viz. 4 feet 8½ inches, with the exception of Russia, Spain, Portugal, and Ireland. The Russian gauge is 5 feet, but the Germans have devised a method by which it is possible to extend the distance between the German waggon-wheels so that they can run on the 5 feet gauge.

When we study the Russian system of railways on their side of the frontier, we find a much inferior system. The Russian railways nearly all have only a single line of rails, the stations are wide apart, the speed slower, and they are badly constructed, and cannot, therefore, carry the same traffic.

WESTERN RUSSIA

(Map VII)

The land frontier runs from the Baltic along East Prussia and Germany till it reaches Austria, thence eastwards to the River Bug, then south across the Dniester to the Pruth, where it marches with the frontier of Roumania.

Here again we have to deal with flat country, rivers, and marshes.

The immense marshes on the southern frontier of Poland practically divide this line into two parts, from a military point of view; this tongue of marshy country, known as the Pinsk Marshes, is practically only crossed by the railway line from Kiev to Brest Litovski.

In Western Russia the natural features of defence against Germany are marked by the course of the Niemen, the Augustow Canal (running north and north-west of Bielostock), the Vistula, the Wartha, and the Prosna.

Against any attack on the south-west frontier the Rivers Pruth, Dniester, Bug, and Pripet are all of importance; near Pinsk the Pripet becomes navigable for steamers.

The great military centre of Western Russia is Warsaw, 120 miles from Thorn, on the Prussian frontier. About 18 miles north-west of it are Novo-Georgievski (or Modlin) at the junction of the Narev-Vistula, on a plateau which commands the two rivers for 15 miles.

The two places form one huge entrenched camp capable of accommodating 60,000 men, but which would require a garrison of about 12,000.

The general line of defence will be better understood by tracing out the fortified posts and towns along the frontier, commencing in the north.

They begin with Goniondy (on the Bober, just inside the frontier and about 3 miles north-west of Bialystock) and Grajewo (on the frontier). Then come Novo-Georgievski and Warsaw, Ivangerod (50 miles south-east of Warsaw, an entrenched camp), Lublin, and Annopol (south-west of Lublin, on the Vistula).

Behind this line we have Kovna and Vilna (commanding the Middle Niemen), Kovel, and Lutsk (east of Lublin).

A third line of defence would start from Riga and follow the line of the Duna, Beresina, and Dnieper.

Riga is strongly fortified towards the sea.

Dunaberg defends the Duna, and Bobruisk the Beresina.

There is a comparatively attractive opening for an advancing force from the west between Vitebsk on the Duna and Orsha on the Dnieper which is stopped by Smolensk, a fortress on the Dnieper and an important railway junction.

Corresponding to the network of railways on the German side there is a very scattered and irregular system of lines on the Russian side.

There are only two lines leading into Poland from St. Petersburg and Moscow and one from the south-east; Bialystock and Brestlitowski are the important junctions on the east of Poland. From these junctions lines run into Warsaw, from which three lines of railways radiate towards the frontier.

From St. Petersburg or Moscow to Warsaw is between 650 and 700 miles.

This long distance over difficult and inhospitable regions still presents as formidable an obstacle to the advance of the invader as it did in the time of Napoleon, if we exclude the increase in railway communications.

An army advancing into Poland from Silesia would strike three lines of rivers—the Prosna, the Wartha, and the Ner.

It would appear therefore that the more promising line of advance for Germany invading Russia would be from Konigsberg and Dantzig towards Warsaw, and perhaps turning its defences; and that for Russia invading Germany an advance towards Silesia, provided an attack from the south can be countered, is within the range of possibility; but enough has been said to enable the reader to discuss the various strategical problems which present themselves.

AUSTRIA

(Map VI)

On the north-east the frontier-line marches with that of South Poland and protrudes itself well beyond the Carpathians before turning south.

We have seen how this affects strategical movements of Russia in Poland, and it will be interesting to consider this part of the frontier with reference to the defence of Austria against an advance by Russia.

The Carpathian Mountains form the natural obstacle; their highest parts stand about the Tatra bastion just south of Cracow, and north-west of them the German boundary approaches close to their lower slopes. The range commences near Presburg and terminates at the Iron Gate on the Danube.

Its easiest crossings lie between the Tatra bastion and the Roumania frontier, especially that by the Vereselle Pass near the sources of both the Dniester and the San.

Both the Dniester and the Pruth, after rising in these mountains, flow south-eastwards.

The following smaller rivers run northwards towards the Vistula, viz. the San, Wysloka, and Donajee, the latter about 45 miles east of Cracow.

There are eight railways crossing the range—two south-west of Cracow, another just at the Tatra bastion, two near Sanok (south-west of Przemysl), two more south-south-west of Lemberg, and another due west of Czernowitz.

In Galicia itself there are two lines of railways, running east and west, one along the foot of the Carpathians, and the other nearer the frontier, the latter connecting Cracow, Tarnow, Lemberg, Tarnopol, and Zaleszczyski. They are all connected up with those crossing the Carpathians.

Only two lines cross the frontier here, viz. the Lemberg-Rovno and the Tarnopol-Odessa lines.

Cracow, Przemysl, Lemberg, and Zaleszczyski (on the Dniester, north-west of Czernowitz) have all been made very strong. Cracow is a large entrenched camp.

The frontier-line from Cracow to the Danube, being of an enveloping nature, gives Russia the advantage of selection in her main line of attack, thus compelling Austria to keep her forces spread out with uncertainty as to the point of attack. It is evident from the dispositions of the railways and the fortified posts that Austria intends in all probability not to retire on the Carpathians, whose passes will all be strongly held, but to retire towards Cracow, making use of the lines of the Rivers San, Wysloka, and Donajee as features for defence.

On the other hand, Russia's slowness of mobilisation and insufficiency of railway accommodation must be taken into account should that country elect to advance both from Poland and Bessarabia simultaneously.

SOUTH HUNGARY

(Map VI)

Bosnia and Herzegovina have been incorporated in the Austrian Empire (1909), and threats of war by Servia and Montenegro against Austria have necessitated the latter country strengthening her frontier in this direction.

The frontier-line of Servia commences at the Iron Gate on the Danube, follows the latter river to a point a little above Belgrade, then along the Save, and finally turns south along the River Drina.

Servia, like Switzerland, suffers from the absence of direct access to the sea, but a large proportion of the frontier is water—200 miles on the Danube, 100 on the Drina, 90 on the Save, and 25 on the Timok.

Everywhere Servia is rough, mountainous, and presents formidable obstacles to the invader. The ends of the Dinaric Alps, Carpathians, Balkans, Despoto Dagh (i.e. the Rhodope Balkans), and Albanian Mountains all encroach on Servia, converging on a chaos of mountain knots, generally thickly wooded and all overhanging long deep torrent-cut gorges with rich pastures.

The Save is much liable to floods, and along the whole of the north frontier of Servia the only bridge is at Belgrade, across the Save. Here the Danube is 1½ miles wide, and the Servian banks generally command those opposite.

The Servian capital, Belgrade, is unfortunately situated from a strategical point of view, being so close to the Servian frontier, though excellent commercially. Its fortifications are somewhat out-of-date, but it is occupied by a strong garrison.

The difficult barriers of the Danube and the Save prevent anything of the nature of a raid from either country, but the conditions on the Austrian side are very favourable for assembling large bodies of troops previous to forcing a passage. Many railways converge on Southern Banat, the country north-west of the Danube at Belgrade, and the Austrian flotilla of warships can be readily utilised on the Danube.

From this base a favourable line of advance for Austria leads through the central valley of the Morava, the granary of Servia, and its agricultural centre. This valley leads into the very centre of the Balkan Peninsula and contains the important railway junction of Nisch, where three lines from Belgrade, Salonika, and Constantinople meet.

On the Bosnian frontier the Drina is the principal feature and would naturally form a necessary line of defence for Austria. Its principal crossings are at Fotcha, Gorazda, and Vichegrad in its upper waters, and these have all been fortified.

There is only one line of railway running south from Hungary into Bosnia; starting from Brod in Slavonia, it follows the valley of the Bosna river to Bosna-Serai (Serajevo) and thence continues through Herzegovina via Metkovitch to Castelnuovo (Zelenika) on the Gulf of Cattaro.

A branch line is constructed from Bosna-Serai (Serajevo) up to the Turkish frontier (Sanjak of Novi-Bazar), terminating at Uvatz on the frontier, with another branch to Vichegrad on the Drina.

The whole of this line from Brod southwards is only a narrow gauge (2 feet 6 inches), and bulk has to be broken at Brod.

The Uvatz branch is probably intended by Austria to be extended towards the Turkish railway, which terminates at Mitrovitza and is referred to later on under "Turkey." (See page 89.)

Cattaro, Trebinje (east of Ragusa), and Bilek, all on the south-east frontier of Herzegovina, are fortified.

Southern Dalmatia has no good harbours except Cattaro (Austrian naval station), and landing troops on this coast must always be a difficult operation owing to the violent storms (known as Boras) prevalent in the district.

There is no doubt, however, that the Austrian fleet would play an important part in the defence of Southern Dalmatia.

ITALY

(Map VI)

A united kingdom of Italy ought to become, by its geographical position, a power of first-rate importance.

A study, however, of its geographical characteristics from a military point of view exposes a considerable number of weaknesses.

The mountains of the Alps form apparently a natural obstacle along the whole of Italy's land frontier, and the sea encircles the remainder;

but history has proved the inadequacy of the former for keeping out the invader, and without the command of the sea the latter becomes an actual source of danger.

The plains of Northern Italy form one of the best theatres for war in Europe, both as regards movements and supplies; once, therefore, the Alps are passed by the invader, the operations of the latter are greatly facilitated. (See Map II.)

The Italian defences in the Western Alps run along their water-parting, but from Monte Rosa eastwards it is much indented and therefore unfavourable for defence; also both the sources of the Ticino and the Adda are in Swiss territory, and the Austrian Tyrol protrudes itself well into Lombardy, including the valley of the Adige.

The great length of Italy, with mountains running down its centre, is also a source of military weakness, for communications crosswise are rendered difficult; the principal communications are forced to follow its length, and (together with its chief centres) are thus exposed to menace by sea.

Along the Austrian frontier, however, except in the valley of the Adige, there are few facilities for the movements of masses of troops, the frontier-line generally following the crest of the hills at an elevation of from 7,000 to 10,000 feet. Between Kreutzberg (near the source of the Drave) and Tarvis the Carnic Alps are not crossed by any roads fit for wheeled traffic. Between the Julian Alps and the Adriatic the character of the frontier changes, the ground falling towards the Venetian plain, and there are no uncommon obstacles to an Austrian advance into this part of Italy on a broad front.

There is one Austrian line of railway leading to the Tyrol frontier by Innsbrück and the Brenner Pass, and three Austrian lines lead towards the Isonzo valley (due south of Tarvis).

The Pusterthal railway connects these two fronts of possible Austrian deployment.

On the Italian side, the Venetian plain has two distinct single lines of railway directed on the eastern land frontier from Padua and Vicenza, and the rivers running to the south-east into the Adriatic present lines of defence against an Austrian advance from the east. For the line of the Brenta, Italy has three railways for concentration, with Verona in rear of it, very strongly fortified.

Both Swiss and Italians have strongly fortified the Simplon route above the tunnel, and military stations have been established by the Italians on the flanks of the route, with permanent garrisons allotted to them.

BULGARIA

(Map VIII)

Bulgaria is now recognised by Turkey as an independent state (1909).

It stands between the Danube and Turkey, and possesses about 200 miles of coast on the Black Sea, on which lie the two ports Varna and Burghas. (See Maps II. and VIII.)

The chief features of the country are the Balkan Mountains, which stretch right across it from west to east, the highest portion being in the centre (8,000 feet).

The slopes are more gentle towards the north than the south, in which latter direction they frequently end abruptly in limestone escarpments.

There are about nine passes with fairly good roads, but many others which have at times been used by troops, usually attended by great difficulties.

The only railway crossing the Balkans runs from Sofia by the valley of the Isker to Plevna and thence divides to Nikopolis and Varna. At Sofia it connects with the Paris-Constantinople main line.

The critical crossings over the Balkans may be taken to be the Upper Isker Valley, the Shipka Pass (4,378 feet), and the Dahral Pass, the latter, on account of its passage, being supported by its proximity to the sea.

The harbour of Kustenjo on the Black Sea is within the Roumanian border, and is connected by railway with Bucharest, crossing the Danube at Tchernavoda by a magnificent bridge, 100 feet above high-water, the only bridge over the Danube in the last 600 miles of its course.

A coast-road connects Varna and Burghas, and the latter is connected by rail with Philipolis.

Neither Varna nor Burghas is a good harbour, but the former was used as a Franco-British depôt in the Crimean War. Just to the north of Burghas there is a small port called Misiori, and 12 miles south-east of it there is Sizeboli, both of which could be utilised for the landing of troops.

The fortified places to the north are Shimla, Silistria, Rustchuk, Lovça, and Vidin, but, except Vidin and Shimla, the fortifications cannot be described as modern. Sofia is strongly entrenched and also Philipolis, as well as the principal passes themselves.

With its independence recognised, and better relations gradually developing between itself and both Turkey and Russia, it is quite possible Bulgaria may develop its great natural resources and powers of defence and eventually become a true buffer state. (See page 41, Chapter II.)

TURKEY

(Map VIII)

The northern frontier of Turkey has been pushed south till it now runs only a little north of Adrianople.

Constantinople possesses extraordinary strategic as well as commercial advantages. Its harbour is large enough to accommodate the largest fleet, the climate is good, and the water-supply abundant. Its food-supply from Asia Minor is inexhaustible, and it occupies a unique position for defence.

Both banks of the Bosphorus are strongly fortified on the water's edge against ships coming either from the Black Sea or the Mediterranean. The Dardanelles are similarly fortified, and where the Gallipoli peninsula narrows to less than 4 miles a continuous line of defences is constructed across the isthmus.

On the land side of Constantinople a number of fortified works defend the approaches, and about 25 miles away to the west are the famous lines extending across the peninsula from the Sea of Marmora to the Black Sea known as the "Bulair" lines.

This position is one of great natural strength, consisting of a ridge 500 feet high, flanked by broad lakes, with numerous marshes in front. The artificial defences extend for about 4 miles, but have not been improved since the

Crimean War, though the armament has been modernised.

There are 150 miles of the Black Sea coast in Turkey with only one port, that of Midia, about 60 miles north-west of the Bosphorus.

The Turkish coast of the Ægean Sea on the north is about 800 miles long, but there are only two places favourable to the landing of troops—at Salonika and at Dede-Agach at the mouth of the River Maritza; the latter is navigable up to Philipolis.

A possible landing might be effected in the Gulf of Kavala, but the country is marshy and malarious. The Constantinople-Salonika railway lies about 20 miles inland from this point, but the roads to it are very bad.

The Adriatic coast of Turkey has practically no harbours or ports of any consequence.

The Rhodope Balkans are a very marked physical barrier, but the Albanian Mountains are much more intricate.

The principal railway in Turkey is the main line from Paris through Sofia, Philipolis, and Adrianople, to Constantinople. The railway from the latter to Salonika leaves it just south of Adrianople and runs down to and along the coast-line of the Ægean Sea.

From Salonika the railway runs up the Vardar Valley over several iron bridges to Uskub, where it branches into two, one to Nisch (in Servia) on the main Paris-Constantinople line, and the other to Mitrovitza, about 30 miles south-east of Novi-Bazar. There is also a line from Salonika to Monastir.

Salonika is a good harbour, and, from its position at the foot of the Vardar Valley, is of exceptional importance. Its land defences are particularly strong, being covered naturally by the presence of lakes.

It will be observed that the valley of the Vardar (250 miles long) runs up to meet the source of the Rivers Stinitza and Ikar (tributaries of the Morava), passing Mitrovitza and close to Novi-Bazar.

The railway already runs to the latter place, so that its extension to meet the Bosnian line from Bosna-Serai (Serajevo) is a project being much pushed by Austria; and in this connection it should be remembered that Salonika is looked upon with covetous eyes by Austria. It will also be observed that the Austro-Turkish frontier is only about 50 miles long, and that, should Austria desire to push down towards Salonika and avoid the difficulties of entering either Montenegro or Servia, it must be through the sanjak of Novi-Bazar. The importance of this small length of frontier and the sandwiched position of this part of Turkey between its two small but bellicose neighbours is therefore of great importance. The difficulty in connecting the two systems of railways in Bosnia and Turkey is that of gauge, as those of Turkey are 4 feet 8½ inches and those of Bosnia 2 feet 6 inches. Should Austria succeed in her desires, any railway connection with such a narrow gauge as far as Mitrovitza would be greatly discounted by the double brake; but no doubt that country would find herself in time compelled to face the expense of converting the narrow into normal gauge, in view of the great strategic and commercial advantages it would give her. The difficulty of connecting the two railways is increased by the fact that the Bosnia line passes through very difficult country and through many tunnels, through which latter no allowance has been made for increasing the gauge.

CHAPTER IV

AFRICA

(Maps IX and X)

BY first taking the physical features of Africa (see Map X.) the general fall of the country and water-partings may be observed by noting the sources and general direction of the Rivers Orange, Zambesi, Juba, Nile, Senegal, Niger, and Congo.

The high lands extend generally from Cape Colony to Abyssinia, but in the extreme north-west we have the Atlas Mountains (400 miles long and reaching to 12,000 feet), and in the Cameroons a peak running up to 13,300 feet.

The Kalahari Desert has already been mentioned as dividing the Transvaal from German South-West Africa. The Sahara, although nominally stretching from the Nile to the Atlantic, has a well-marked rising plateau or line of hills dividing it, and extending from the Tasili Plateau to the Tibesti Mountains.

The political divisions are a striking commentary on the advance of European nations to the South, and the general scramble for colonial possessions, or spheres of influence. (See Map IX.)

British South Africa includes Cape Colony, Natal (with Zululand), the Transvaal, Orange River Colony (now called the Orange Free State Province), Rhodesia, Basutoland, Bechuanaland, and Swaziland.

British West Africa includes the Gambia, (chief town, Bathurst), the Gold Coast Colony (Kumasi), Sierra Leone (Freetown), Southern Nigeria (Lagos), and Northern Nigeria (Zungeru).

British East and Central Africa include the Somaliland Protectorate (Berbera), the East African Protectorate (Nairobi), the Uganda Protectorate (Entebbe), the Zanzibar Protectorate, and the Nyasaland Protectorate (Blantyre).

French Africa consists of the colony of Algeria and the Tunis Protectorate; the four main divisions on the West coast (Senegal, French Guinea, Ivory Coast, and Dahomey), penetrating inwards to Upper Senegal and Mauretania, which form a hinterland for all the colonies on this coast. This is joined by the French Congo and stretches away northwards towards Algeria. On the East, France's only possession on the mainland is a portion of Somaliland. The coast-line of the latter extends for 60 miles, and its inland frontier is fixed at a distance of about 57 miles from the sea. Jibuti is its port, which is being developed with jetties, etc., to accommodate large vessels, and a railway from there to Harrar and thence to Adis Ababa, the present capital of Abyssinia, is being constructed, of which about 190 miles (to Dirre Daua) have been completed.

In an Anglo-French agreement it is laid down that neither country can annex Harrar.

German Africa consists of Togoland (Lome), Cameroons (Duala), German South-West Africa (Windhoek), and German East Africa (Dar-es-Salaam).

The territory of Walfish Bay in German South-West Africa is British and belongs to Cape Colony.

Italian Africa consists of the colony of Eritrea and a protectorate over part of the Somaliland coast from Cape Guardafui to the Juba river, on which latter Italy has a station.

Eritrea consists of a triangular portion of barren and sandy lowland between 12° and 18° N. with a coast-line on the Red Sea of about 700 miles long. The capital is Asmara, and the chief port Massowa, which has a good harbour.

Spanish Africa consists of the coast towns of Tetuan, Ceuta (opposite Gibraltar), Gomera, Ifni, Alhucenas, and Melilla in Morocco, and the Zaffarin Islands close to Melilla.

There is also a Spanish protectorate over the coast districts lying between Bojador and Cape Blanco called Rio Di-Oro. In the Gulf of Guinea there are Spanish Guinea (south of the Cameroons) and the islands of Fernando Po.

Portuguese Africa consists of Portuguese Guinea (south of the Gambia), the territories of Landana and Cabenda, a small tract of country on the coast north of the Congo river estuary, Portuguese West Africa (St. Paul de Loanda), and Portuguese East Africa (Lorenzo Marques and Mozambique).

Liberia is an independent negro republic in North Guinea, occupying about 350 miles of coast-line; its capital is Monrovia.

The Congo State now belongs to Belgium, and much interest attaches to the development of this important centre of Africa, and to the general effect it will have on Belgium itself. The Belgians are a new nation in the fields of colonisation, and there appears to be no reason why, with the administration of justice and good government, the result should not eventually fulfil great expectations.

THE EMPIRE OF MOROCCO

Morocco, Abyssinia, and Liberia are the only independent states in Africa.

The Empire of Morocco is the most western of the Barbary States and consists of Fez and Morocco north of the Atlas, and the territories of Sus, Dra, Wadi Tafilet, Tuat, and others to the south. It possesses about 800 miles of coast-line on the Atlantic and about 200 miles on the Mediterranean. The seat of government is at Fez. Cable communication runs both from Tarifa (in Spain) and Gibraltar to Tangier, and there are wireless stations at Tangier, Rabat, Casa Blanca, and Mogador. It is a country full of wealth, both agricultural and mineral, and possesses a delightful climate, but is barbarously governed. It is jealously watched by all the European powers, and none of them have hitherto ventured to interfere with it without being warned off by some of the others. Owing to its geographical position and attributes it must always be a great centre of interest and attraction to any of the powers, who will no doubt watch their opportunities for installing themselves in such a highly desirable country.

ABYSSINIA

(Map XVI)

Apart from its Coptic Christianity and mysterious origin, the geographical situation and characteristics of Abyssinia make it of exceptional interest to us in Great Britain.

This country stands up on a high mountainous tableland, bounded by British East Africa on the south, British Somaliland on the east, and the Egyptian Soudan on the west. It looks down on our waterway to the east and is the source of the Blue Nile, and furnishes the chief fertilising mud or slime carried down by the Nile into Egypt, and upon which the prosperity of the latter depends so much.

The Emperor's political army numbers about 200,000, armed with rifles and modern artillery (the latter captured at Adowa), out of a total population of about 3,000,000.

An unfriendly country, therefore, with these attributes and situation, cannot be disregarded when considering the safety of the Egyptian Soudan and the general position of the Cape to Cairo railway route.

French interests are still considerable in Abyssinia—they manage the posts and the telegraphs, and the only railway in the country runs from Jibuti in French Somaliland to within 25 miles of Harrar (metre gauge) and is gradually absorbing the coasting trade from the interior; the French also carry on an extensive private business as commercial agents throughout the country. The attitude, therefore, of the ruler of Abyssinia towards British interests must always be of great importance, and the countries also immediately interested are France and Italy.

On December 13, 1906, an agreement was signed between these three powers and Abyssinia by which they each undertake to respect and endeavour to preserve the integrity of Abyssinia, to abstain from intervention in the internal affairs of the country, and to concert together for the safeguarding of their respective interests in territories bordering on Abyssinia.

The agreement is an important one, as, if at any time France desired to use her influence in Abyssinia in an antagonistic manner, it would probably mean the upkeep of frontier garrisons of considerable strength both in the Soudan and Somaliland; and this agreement, supported by the *entente cordiale*, should render such action unnecessary, and in all probability should continue the *status quo.*

This agreement also lays down that railways in Abyssinia, west of Adis Ababa, shall be constructed by Great Britain, and recognises the latter's right to construct a railway from British Somaliland across Abyssinia to the Soudanese frontier.

In this connection it is observed that it has been lately decided to withdraw from the military occupation of Somaliland, except at Berbera and Zeila, which will be provided with modest defences.

The highest mountain in Abyssinia is Ras Dashan (15,200 feet), north-east of Lake Tsana, only a little lower than Mont Blanc; but the most marked mountain-chain is that running from Adigrat (on the northern boundary) due south to Adis Ababa, and which forms a water-parting about 7,000 to 8,000 feet high between the Red Sea and the Nile. This chain forms an escarpment to the east, and, generally speaking, the slopes to the west are longer and fall more gradually.

The perpetual snow-line stands at about 13,000 feet.

The mountains are volcanic in origin, and contain little mineral wealth; but iron and coal are not uncommon.

The chief river of the country is the Blue Nile rising from Lake Tsana. (See Map XVI.)

The Atbara also rises in the Abyssinian highlands—in the rains becoming a formidable river, and in the dry weather becoming an insignificant stream.

The Omo runs south into Lake Rudolf, and the Hawash runs north-east and loses itself in the plains of Tajura. All these rivers are useless for navigation purposes within the country, and in the dry season are mostly fordable.

There are three regions or zones, marking great differences of climate owing to their respective altitudes.

In the lower regions (called the hot lands), up to about 4,000 feet above sea-level, the usual tropical growths such as cotton, sugar-cane, coffee, and bananas flourish.

In the middle regions, up to about 9,000 feet, a climate resembling that of Italy exists, producing vines, peaches, oranges, potatoes, etc.

The higher regions produce wheat, oats, barley, maize, and cattle.

There are two seasons in the year, a dry winter and a rainy summer, when the rainfall is very heavy, varying from 40 to 100 inches.

The chief towns are Adis Ababa, now the capital; Gondar (just north of Lake Tsana), which was once the capital; Magdala, the stronghold taken by Lord Napier in 1868; and Samara (or Debra Tabor, just east of Lake Tsana), which is now the military capital, and where the Emperor sometimes resides.

Places of strategic importance on the west boundary are Nassar (on the Sobat), Famaka (on the Blue Nile), Metemma (on the Atbara), Kassala in the Soudan (on the Khoret-Gash, a tributary of the Atbara); on the north, Adowa and Adigrat; on the east, Ankober and Harrar; and on the south, Adis Ababa. They all stand on approaches to the interior, but are not fortified. There are no proper roads, only tracks or mountain-paths, and no wheeled transport can be used.

EGYPT AND THE SOUDAN

(Maps IX and XVI)

The history of Egypt, and its geographical central position, must always confer on it the greatest interest and importance to all the Great Powers, but more especially to Great Britain, whose highways to the East and South-Eastern Africa must be affected by its present and future peace and prosperity. We should note too that all the great international routes of the world now converge towards it.

The Suez Canal, the Red Sea, and the Nile river are the three prominent features which first strike the observer, and when one studies the enormous stretch of country from Alexandria to Lado on the Nile, where it touches the northern boundary of Uganda, a distance of nearly 2,000 miles, the military observer cannot but wonder how this extended vital chord is to have its integrity kept intact by Great Britain.

Luckily it has some redeeming defensive features. The strategic points of possible attack may be said to be confined to the Suez Canal, Cairo, and possibly the great water-dams across the Nile at Assouan, Assiut, Zifta, and Esneh. The cultivated portion of Egypt is confined to the country annually inundated by the Nile or irrigated by canals; and these water-dams are monuments of engineering skill.

The land boundary on the east runs in a straight line from Kelaat at the head of the Gulf of Akabah to a point on the Mediterranean just 18 miles east of El-Arish.

The western land boundary commences at the Gulf of Sollum on the Mediterranean, and runs south-west along the boundaries of Tripoli (a province of Turkey). It then turns south along the French-African boundaries (including the Soudan provinces of Darfur and Bahr-el-Ghazal) till it reaches Gondakoro on the Nile. It then runs along the northern boundary of British East Africa till it meets the Abyssinian frontier just north of Lake Rudolf, whence it marches with those of Abyssinia and Eritrea, meeting the Red Sea about 120 miles south-east of Suakin.

Egypt Proper only extends south as far as Wadi Halfa (560 miles from Cairo), where the Egyptian Soudan commences, of which Khartoum is the capital.

The positions of the deserts in Egypt Proper are a point of great importance—that of the Libyan Desert on the west, and the Arabian Desert on the east, and south of the latter again the Nubian Desert.

There is a network of railways in the Nile Delta. A single line of railway on the standard gauge (4 feet 8½ inches) runs south from Cairo to Luxor (near Thebes), and continues south to Shellal (near Assouan). Between the latter place and Wadi Halfa communication is by good steamers on the Nile, and from Wadi Halfa the narrow gauge is continued to Khartoum and Senaar (on the Blue Nile), crossing the Atbara and Blue Nile on iron bridges. A branch line runs from Wadi Halfa to Hannik at the third cataract. Port Soudan and Suakin are also connected by rail with Atbara on the main Khartoum line (331 miles), and a short branch runs from Abuhammed to Karinia at the fourth cataract (138 miles). All lines south of Luxor are on the 3 feet 6 inches gauge.

The annual overflow of the Nile is one of the marvels of the world, as for countless ages it has risen to within a few inches of the same height and to within a few hours of the same time year after year. In Lower Egypt the rise begins about June 16, most of the flood-water being dependent on the supplies from the Abyssinian mountains by the Atbara and the Blue Nile. It is practically the only source of water in Lower Egypt, for rain seldom falls, and together with its canals furnishes waterways for traffic and travel.

Navigation is feasible between the cataracts, and tourist steamers run between Khartoum and Gondakoro (Uganda) viâ Kodok and the unique "sudd" region, and other steamers run up the Blue Nile, the Sobat, and the Bhar-el-Ghazal rivers.

Kassala, Gallahat (i.e. Metemma, on the Abyssinian frontier), Rosaires, Taufikia, El-Obeid, and Nahud are in telegraphic communication with Khartoum, and the main telegraphic line from Cairo to Khartoum runs southwards to Uganda (Entebbe and Mombasa), and will very shortly be connected with the South African lines, which have been extended from Salisbury (Rhodesia) to Ujiji on Lake Tanganyika.

Except Alexandria and Port Said, there are no ports on the Mediterranean, and on the Red Sea there are Suez, Port Soudan, and Suakin.

From the foregoing it will be observed, therefore, that although Egypt and the Soudan are growing and will grow in importance, they still have their most vulnerable strategic points in Lower Egypt; assuming, therefore, that Great Britain still commands the seas, there is only one direction from which an attack on Egypt has any apparent probability of success, and that is by the Sinai peninsula.

No doubt in the future the Soudan may even rival Egypt Proper in its prosperity, but in any case that time is still far distant. Major E. A. Stanton, the late Governor of Khartoum, in a recent lecture, stated that some day Khartoum would be the largest town in Africa, would be the centre of an enormous cotton trade, and that it was on the Southern Soudan that the future of the country would depend, but that the paucity of the population was the only bar to development.

The dominating position of Abyssinia with reference to the British Soudan has already been referred to, and an unfriendly ruler in that country, backed up by one of the Great Powers, would be a danger to reckon with; but even then Abyssinia could not be supported by any of the Great Powers from the Red Sea and the Gulf of Aden while the command of the seas rests with Great Britain.

The land boundary of Egypt with Palestine (Turkish) runs about parallel to the Suez Canal from Kelaat (head of the Gulf of Akabah) and about 150 miles from it (see Maps XIII. and XVI.). Any hills of consequence lie in the southern part of the peninsula and do not interfere with the two caravan routes running straight from Kelaat to Suez and from El-Arish (on the Mediterranean) to El-Kantara (about 20 miles north of Ismailia). These are practically desert routes and badly supplied with water.

The character of the coast along the Egyptian-Mediterranean shore is shallow and difficult of approach to warships, except at Alexandria, Port Said, and El-Arish. Landings at places other than the first two are in stormy weather attended with great difficulties on account of the surf.

Kelaat, at the head of the Gulf of Akabah, could be approached by small warships.

The operation of invading Egypt, even by sea and unopposed, would be a difficult one supposing the ports of Suez, Alexandria, and Port Said were not available, for desert-like countries protect it on all sides, and it makes it outside the region of practical politics if the command of the sea is retained.

On the land side, on the other hand, an invasion is open to discussion.

An invader from the North and East would establish bases at or near Rafa (on the Mediterranean) and Kelaat and along the intervening frontier (see Map XV.), but would have to advance on the Suez Canal along the caravan routes, a distance of about 150 miles, providing its water and supplies from its rear. It would naturally be opposed in front and its bases and communications would be threatened by attacks on Rafa and Kelaat or their vicinities.

Enough has been said to show that the study of military geography must ever interpret this enterprise as a very difficult one for the invader; at the same time we must note the facilities of establishing bases and lines of communication for such a project which are being afforded by the construction of the Damascus-Hedjaz railway.

The standard European gauge (4 feet 8½ inches) runs north from Rayak (near Damascus) to Aleppo. In course of time it will be eventually linked up with the Anatolian or Baghdad railway somewhere west of Adana (probably at Tel-Habesh, about 30 miles north of Aleppo). (See Map XV.)

From Rayak southwards it runs through Damascus to Medina (980 miles) (from Damascus southwards, with a gauge of 3 feet 5·34 inches), passing just east of the Dead Sea, and thence to Ma'an, 60 miles from the Egyptian frontier; here it turns south-east and, skirting the eastern shore of the Red Sea, reaches Medina, which is 258 miles from Mecca and 300 from Jedda. Short branches from it communicate with Beirut and Haifa on the Mediterranean. It will also eventually be extended from Medina to Mecca. This railway line has been ostensibly constructed for religious purposes to enable the devout Mahomedans of Turkey in Asia to visit the Holy City of Mecca with greater facility; but the military observer will see at once the strategic facilities it gives the Sultan in rendering the task of governing his widely spread subjects easier, both physically and morally. It accomplishes, however, more than this, for it enables Turkish troops and their allies to be conveyed in a few days to within 60 miles of the Egyptian land frontier and threaten our security there. No doubt before any effective advance on Egypt from there could be made, light military railway stores would have to be collected; but the situation distinctly wants constant consideration.

RAILWAYS IN AFRICA

(Map IX)

Apart from the railways already mentioned in Egypt, the Soudan, and French Somaliland, it will be well to notice those giving access to parts of military importance.

The Uganda railway starts from Mombasa, which possesses, perhaps, the finest harbour on the east coast of Africa; it is connected with the mainland by a bridge 1,730 feet long.

The railway is a single line on a metre gauge and terminates at Port Florence (584 miles) on the Lake Victoria Nyanza.

A railway is under construction from Jinja (where the Nile at the Ripon Falls flows out of the Victoria Nyanza) to Kakindu, a point beyond the rapids of that part of the Nile where the Victoria Nile becomes navigable. Although only 50 miles long, this line will, by turning the rapids, establish connection with steam navigation on Lake Chioga and the surrounding waterways.

In German East Africa a railway (metre gauge) runs from Dar-es-Salaam to Mrogoro (132 miles), and is being extended to Tabora.

Another line (metre gauge) runs from Tanga to Karagwe (54 miles).

In Portuguese East Africa a line is being constructed from Quilimane on the coast to Lake Nyassa by the British Central Africa Company.

The Cape to Cairo railway is well on its way towards completion. Starting from Cape Town (gauge 3 feet 6 inches) and passing Kimberley and Mafeking, it runs fairly straight to Bulawayo, a total distance of 1,362 miles; a branch runs from here to Salisbury (300 miles), and thence to Umtali and the port of Beira (Portuguese), a distance of 375 miles.

The main line is continued from Bulawayo to the Victoria Falls, where it crosses the Zambesi, and thence is directed towards Broken Hills; here it turns to the north-west and runs to a point at or near Mayaba on the frontier of the Congo State in the Katanga province. It will eventually be extended north to the navigable waters of the Lualaba river, which is the prolongation of the Upper Congo. How it will eventually be prolonged still farther north it is for the future to decide; it may, however, be expected that its extension northwards will be through the Congo.

In German South-West Africa a railway (gauge 23·63 inches) runs from a port called Swakopmund (immediately north of Walfish Bay) to Grootfontein (400 miles), and another to Windhoek, the capital (237 miles). Another line (gauge 3 feet 6 inches) runs from Luderitz Bay (Angra Pequina) to Kalkfontein (270 miles), a point only about 80 miles from the Bechuanaland frontier, which might make it of strategical importance to British South Africa.

In the Congo a railway (gauge 2 feet 6 inches) runs from Matadi (95 miles from the mouth of the Congo river, up to which large steamers can navigate) to Leopoldville (240 miles). This bridges the part of the river rendered unnavigable by rapids. Another line (gauge 2 feet) runs from Stanleyville on the Upper Congo to Ponthierville (90 miles), another part of the river also unnavigable.

In Nigeria a railway (gauge 3 feet 6 inches) starts at Baro, 330 miles up the Niger at the head of its navigable parts, and runs to Zaria, and is being extended to Kano; another line runs from Lagos viâ Ilorin to Jebba on the Niger, a distance of 304 miles, and is now extended to Zungeru and Zaria, where it joins the railway from Baro.

In Dahomey the French have constructed a railway from Kotomi (metre gauge) on the coast to Carnotville, running due north (200 miles).

In the Gold Coast Colony a railway runs from Sekondi on the coast to Kumasi (168 miles); and another railway is being constructed from Accra into the interior.

In Sierra Leone a railway (gauge 2 feet 6 inches) runs from Freetown into the interior, with its terminus at Baima, near the Liberian frontier.

In French Guinea a railway (metre gauge) runs from Konakry on the coast to Kurissa on the Upper Niger (350 miles), and will be extended to Kankan.

In Senegal (French) a railway (metre gauge) has been constructed from Dakar to Rufisque and thence north-west to St. Louis, at the mouth of the Senegal river (165 miles); also from Kayes, on the same river, a metre-gauge line has been constructed to Kouli Koro on the Niger (347 miles).

In Algiers the railway connects Hammamet, Tunis, Algiers, and Oran on the Mediterranean with branches to Tebessa, Biskra, and Tiaret, and two important strategical branches run to Sebdou and Figig, both on the eastern frontier of Morocco.

CHAPTER V

NORTH-WEST FRONTIER OF INDIA

(Map XIV)

THIS frontier may be said to extend from Kashmir to the Arabian Sea, some 1,200 miles apart, and its study from a military point of view is so connected with the states both great and small which lie beyond it that it will be necessary not only to consider the actual frontier itself, but the geography of Baluchistan, Afghanistan, and both Russian and Chinese Turkistans.

The physical features are best understood by following as a preliminary study the general directions of the large mountain ranges and the more important rivers.

Commencing at the Pamirs, "Where three Empires meet" (but where in fact four empires meet), we have the highest parts of the Hindu Kush, which stretch away towards the south-west just north of Chitral and Kabul and lose themselves in the Hazara highlands.

From the same point at the eastern end of the

Hindu Kush the Muztagh range (or Karakoram) runs south-east to the Kashmir frontier with China, and the Sarikol range runs north, dividing Russia from China. The Sufed Koh range, running east and west, divides the Kabul river valley from the Kuram river valley, and from the latter a broken range of mountains runs south through Waziristan, and is continued by the Suliman Mountains and the Kirthar range to the Arabian Sea.

This great mountainous belt does not, however, end here, for it curves away westwards through Makran in innumerable parallel ridges, twisting round gradually northwards into Persia.

There is no real break in this long, extended system, although it is pierced here and there by the rivers which drain through it from the highlands beyond, and which generally form more or less practical transverse routes from the plains of India into Afghanistan. There is, however, a remarkably flat triangular desert inlet from the Indus valley, running from south to north, penetrating the hills at the entrance of the Bolan route to Quetta. The latter stands on a high plateau, and is surrounded by high and massive peaks in the neighbourhood of Pishin.

Taking now the important rivers, it will be well to trace the Indus, which rises north of the Himalayas, flowing to the north-west nearly to Gilgit, and thence taking an almost straight south-west course to Karachi. It receives on its left bank the waters of the Jhelum, Chenab, Ravi, and Sutlej, which, with the Indus itself, make up the "Punjab" or "Five Rivers."

On the right bank it receives the Kabul river at Attock, which is 900 miles from the sea, and where the main line of railway crosses it en route to Peshawar. It is only bridged at Attock, Khushalgarh, Sukkur, and Haidarabad, where the railways cross it, and bridge-heads are made for their defence.

The Indus river in its upper courses is swift, and rushes down in a deep, rocky, and narrow bed at Attock, below this widening to about one-third of a mile, and afterwards, when the other rivers of the Punjab join it, widening out to a mile.

In the flood season (when the snows melt) it overflows its banks for miles, and, changing its course not infrequently, is full of shoals and sandbanks.

The Kabul river takes the drainage of the southern slopes of the Hindu Kush, rising west of Kabul itself, and runs through the mountains by Jellalabad to Attock.

The Kabul river has two important tributaries, the Kunar and the Swat rivers, running parallel to each other, the former rising in the southern slopes of the Hindu Kush, near the Pamirs.

The Kunar Valley is of exceptional interest, as the ancient high-road from Kabul to India ran across it to Bajaur, and, moreover, it affords certain facilities for the opening of a route from Jellalabad to the Mandal and Dorah Passes across the Hindu Kush into Eastern Badakshan and the regions of the Oxus. This route would offer a far more direct connection between the Oxus regions and India than any which now exists, but the passes are high (14,000 feet), difficult, and very much more buried in snow than any farther west.

It will be observed that the southern approach to the Mandal Pass by the Bashgol Valley (viâ the Kunar) lies in Afghan territory, but that the approach to the Dorah Pass (viâ Chitral) lies outside of it in British territory.

The next river of importance is the Helmund (600 miles long), which rises with several tributaries near Kabul, and runs south-west, bending round to the north as it approaches the Persian boundary, losing itself in the swamps and lakes just north of Seistan. This extraordinary depression also receives the waters of all the rivers from the Hazura highlands, none of which flow into the sea.

The Oxus (or Amu) rises in the Pamirs at Lake Victoria, and thence forms the Russo-Afghan boundary as far as Kwaja-Salar, or Khamiab (north-west of Balkh), and then flows north-west into Lake Aral. It is navigable up to the Afghan frontier. None of the rivers in Afghanistan are navigable.

Having followed the principal mountains and rivers, and grasped the main physical features, it will now be easier to follow the situation of the frontier boundaries and provinces.

From the Pamirs southwards to Persia and the Arabian Sea there are two India boundaries to be considered—firstly, the boundary inside which the country is actually administered and controlled by British India; and secondly, the boundary delineated in 1895 under the Durand Agreement with the Ameer of Afghanistan, which settled the responsibilities of the Kabul Government as regards the independent tribes lying between the two boundaries. This latter is now the only boundary to consider or recognise for international purposes.

The tribes lying on or near the frontier-lines have always been intensely independent, and have never yet been thoroughly subdued either by Afghan or Briton. They look on the vicarious phases of frontier fighting as a normal condition of existence. The Kafirs of Kafiristan, and their Pathan neighbours, the Mohmunds, Bajauries, Swatis, Afridis, and Waziris, are alike in this respect, but very unlike in their tribal constitution and idiosyncrasies. They differ so much in character, and even religion, that there is no possibility of any spirit of combination between them. The Kafirs are regarded as outcasts and infidels by the rest.

Swatis and Mohmunds are chiefly Afghans talking the same language, imbued with the same faith, and acknowledge the Ameer as their spiritual head, but are practically independent. Afridis and Waziris are allied in tongue and religion with Afghans; they are all Pathans, talking Pushtu, but admit no sort of race affinity.

Excepting the Kafirs, all of them would appeal to the Ameer as arbitrator in their disputes, adviser in their military adventures, supporter and provider of refuge in distress, and spiritual guide in their religious counsels.

All mere sympathetic bonds, however, would not and did not prevent the Ameer from intermeddling with their affairs or threatening their independence and bringing dominant Afghan control right down to the borders of the British administrative frontier.

The Durand Agreement, therefore, was a necessary preliminary before we could deal with these independent tribes without involving ourselves in a war with Afghanistan.

In addition to the two boundaries referred to, however, a third one, that of Afghanistan itself on its north and west sides, must also be taken into account, for Great Britain has guaranteed the integrity of Afghanistan,[1] and in any case it is now acknowledged by the best authorities that it would be a mistaken policy to allow any power to overrun that country and establish itself there. We are bound, therefore, to fight for the defence of India beyond these frontiers and not within them.

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[1] Agreement with Ameer, March 1905.

Studying these three boundaries, it will be observed that they all start practically from the Pamirs.

At this point both the Russian boundary and the Durand line start from the Chinese boundary and, running westwards for about 200 miles, leave a narrow strip of country between them belonging to Afghanistan.

This strip of Afghan territory, referred to generally as Wakhan, narrows in some parts to only 8 miles in width; nevertheless, it acts as a buffer to any aggression on the part of Russia, and it is here that the Oxus takes its rise, the Russian boundary running along the latter.

The Durand line turns south near Chitral, crosses the Kabul river about 35 miles west of Peshawar, and, following the eastern line of hills, reaches New Chaman, 70 miles south-east of Kandahar, and, turning westwards near Nushki, finally terminates at Koh-i-Malik Siah (or Robat) on the Afghan-Persian boundary.

The Baluchistan-Persian boundary runs south-east from Koh-i-Malik Siah and eventually reaches the Arabian Sea just west of the Dasht river, or 40 miles west of Gwadar.

The Durand line from the Pamirs and the above Baluchistan-Persian boundary defines the international boundary of India on its north-west frontier.

The old administrative boundary started at the Pamirs at a point in the Durand line about 50 miles west of the Chinese boundary, running along the Shandur range, which separates the Chitral from the Gilgit Valley; thence it turned south-east, crossing the Indus and joining it again about 100 miles farther down; thence, passing west of Peshawar, it ran more or less parallel to the Indus and about 50 miles west of it till it reached the Kirthar range and the Arabian Sea.

All the country between this old administrative boundary and the Durand line as far south as the Gomal river now falls within the political sphere of the North-West Frontier Provinces administration, and includes those wild and ungovernable tribes who have hitherto baffled all efforts of the Indian Government to subdue them.

The northern boundary of Afghanistan commences at the Pamirs (from Chinese territory) and follows the line of the Oxus river, only leaving it at Khamiat (north-west of Balkh), whence it runs just south of Penjdeh to Kushk, but a few miles north of the latter.

The terminus of the Russian railway is at Kushk Post, a few miles north of the boundary.

The boundary is continued from Kushk westwards till it joins the Persian boundary at Zulfikar. From here it runs almost due south, passing through Seistan, and joins the British frontier-line at Koh-i-Malik Siah (or Robat).

Beyond and west of the old administrative line we have established control over certain routes and places, British Baluchistan being the most important, and containing the entrenched camp of Quetta. The railway from Sukkur connects it with the Indian system and is completed as far as Chaman and Nushki. Without going into a detailed description of Quetta and its surroundings it will be sufficient to say that all routes from the West in this part of the world converge on it, that any advance westwards from the head of the railway at Chaman towards Kandahar has no great physical difficulties even for a railway in front of it, and that it is naturally an exceptionally strong position for defence. From Sukkur on the Indus to Quetta is 250 miles, and to the advanced post at New Chaman it is about 70 miles farther. From Sibi to Quetta the ascent is about 5,000 feet.

The Gomal route lies north of Baluchistan, and forms an important avenue of approach either to or from the highlands of Afghanistan or Baluchistan (the latter viâ the Zhob Valley). We hold Wana on this route as an outpost.

Passing northwards, the next route is by the Tochi Valley, leading from Bannu to Ghazni (120 miles)—this leads over very mountainous country and is little used; it is doubtful if it could be used successfully by a military force of any size.

The next pass, and one of the most important, is by the Kuram Valley, and thence over the Peiwar Kotal (9,200 feet) and the Shuturgardan (about 11,000 feet) to Kabul. It is closed by snow for part of the year. The railway now runs from Khushalgarh on the Indus (which is bridged here) to Kohat and Thal (5 feet 6 inches gauge) and up to Parachinar in the Kuram Valley (2 feet 6 inches gauge).

The Khyber route runs from Peshawar to Kabul (180 miles), the railway ending at Jumrud on the frontier, and a good road the rest of the way. A strong military position is held by us at Lundi Kotal on this route, a few miles east of the Durand line and west of the Khyber Pass. This is the best and trade route to Kabul.

A railway branches off the main Peshawar line and runs to the Malakand Pass, from whence a good road now gives free access to the Swat Valley, and along this route our last and farthest north-west outpost at Chitral is relieved and supported. There is also a passable route from Gilgit to Chitral.

A narrow-gauge railway has just been completed from Mari Kalabagh to Bannu, viâ Lukki. Except for assisting to settle this truculent part of the frontier it has little strategical importance, particularly as the Indus will remain unbridged at Kalabagh.

It will be gathered, therefore, that between India and Afghanistan extends a great belt of rocky, crag-crowned mountains dividing and dominating many narrow valleys of exceeding fertility, but with great difficulty of approach. This belt of mountain country stretches northwards, growing higher and more formidable till it meets the Hindu Kush and other ranges at the Pamirs, where we see peaks running up to 24,000 feet, and routes over passes at 12,000 and 13,000 feet in height, the crossings of which are often impossible and at all times difficult, even for small well-equipped parties; and these difficulties lie many of them on the Indian side of the boundary, so that at this part of the frontier there is not only the Wakhan-Afghan territory to be crossed by any advance on the part of Russia, but almost insuperable physical difficulties afterwards.

In the Hindu Kush to the west we have the Dorah Pass (14,800 feet) and Mandal Pass (15,200 feet), but they also are closed for most of the year by snow, and in any case can only be crossed by foot passengers at present.

There is practically, therefore, no pass for the use of military forces of any consequence over the Hindu Kush to the east of the Khawak Pass (11,640 feet), which lies almost due north of Kabul. West of this, there are the Kaoshan Pass

(14,300 feet), the Chahardar Pass (13,900 feet) and the Bamian Pass (12,000 feet); the two latter and the Khawak have good roads and are trade routes, but the routes through them converge as they go northwards, meeting at Haibak, and a good road leads on to Tash-Kurghan (50 miles east of Balkh) and Termez on the Oxus. Between the Hindu Kush and the Oxus is a country of defiles, gorges, and rocky glens. Tash-Kurghan to Kabul is 250 miles by the Chahardar route.

As we proceed westwards we find the Hindu Kush divide continued, but called the Koh-i-Baba and the Paropamisus.

Across this divide there are no routes of any consequence till we reach those north of Herat, where the approaches to the latter present little difficulty, the Ardewan Pass and others being little over 5,000 feet high.

Roads in Afghanistan are few, and wheeled transport is never used. In addition to the routes mentioned to Quetta, from Sukkur, and to Kabul from Peshawar, there is a good road from Kandahar to Kabul (330 miles), with Ghazni en route.

There is a good road from Quetta to Kandahar, then to Girishk on the Helmund, Farah, Sabzawar, and Herat (530 miles long). Along this route there are no physical obstacles of any importance, the road being for the most part level or undulating, but after crossing the Helmund it skirts the southern part of a country with a teeming population of the fiercest and most untamed tribes of Durani Afghans, whom even the Ameer seldom interferes with.

A road from Kandahar also follows the left bank of the Helmund into Seistan.

From Nushki a road leads westwards, keeping south of the Durand line till it reaches Koh-i-Malik Siah (or Robat) and thence continues on through Seistan to Farah and Herat. The telegraph-line already follows this route and is continued on through Kerman and Yezd to Bushire and Teheran.

There is only one route between Herat and Kabul (500 miles long), principally made for military purposes; it is mountainous, difficult, often impassable, and supplies are scarce.

Kabul, Ghazni, Kandahar, and Herat are the four towns of importance in Afghanistan. Kabul, the capital, stands at about 6,000 feet above the sea, Ghazni 7,300 feet, Kandahar 3,300 feet, and Herat 3,000 feet, which shows the general fall of the country to be from north-east to south-west.

Herat is a square city covering about a mile in space, with formidable mud ramparts towering to a height of 80 feet above the plain. It was greatly strengthened in 1885, when it was anticipated that the Russians would advance on it from Penjdeh, and it was considered then it could not have been taken by a *coup de main*, and would have necessitated something of the nature of a siege to force it to capitulate. Mud walls are proverbially difficult to destroy, and a regular siege would have been a long undertaking.

There are four principal provinces—Kabul, Kandahar, Herat, and Turkistan. The latter includes Badakshan, Kafiristan, and Wakhan.

Turkistan is so often vaguely referred to by writers on Eastern questions that it is advisable to note the limits (see Maps XIII. and XIV.) of Afghan Turkistan, Chinese Turkistan, and Russian Turkistan. The two latter are very large provinces, abutting directly on the frontier of Kashmir and North Afghanistan along the Oxus.

The climate of Afghanistan is dry, with extreme temperatures in winter and summer. There are two harvests generally, that reaped in summer being chiefly wheat and barley; the other, reaped in the autumn, consisting of rice, millet, and Indian corn. It is rich in fruits, and sheep and transport animals are bred.

We can now consider the railways on both sides of these frontiers.

Considering the railways in India together with the construction of the electric telegraph it cannot escape even the most casual observer what a change they have wrought on the military situation there. In a few words, it is by these that India is now strategically held. They have made it possible to bring the main bulk of its military strength to bear upon any given point in as many days as it formerly took months, and to maintain it there with supplies and munitions of war. They have also enabled troops to be removed or reduced from around the enervating and insanitary neighbourhoods of large native cities, and to concentrate them in peace time in advantageous and more healthy places; all this has been done without any practical addition to the army of India as a whole compared to its strength at the time of the Mutiny in 1857.

The main lines of railway running to the north-west frontier are all on the standard Indian gauge (5 feet 6 inches), including that to Quetta, Chaman, Nushki, and Thal (in the Kuram). The branches to Malakand and the Thal-Parachinar line are, however, only 2 feet 6 inches gauge, and are primarily intended as military lines. There are, however, a number of metre-gauge lines in India (principally in Rajputana), and, though commercially they are an advantage, the change of gauge must cause difficulties in the rapid transit of troops and supplies at critical periods.

The north-west frontier has, however, with the above exceptions and the Jodhpur-Haidarabad line, only one gauge, and from the map it will be seen that the great military centres, Ferozepore, Lahore, and Rawal Pindi, are amply supplied with railway communication in connection with the railway, running along the left bank of the Indus from Attock to Haidarabad. From Sukkur a line also runs along the right bank to Karachi, and from Haidarabad a metre-gauge line runs eastwards to Jodhpur, and connects there with the Bombay lines.

Thus we see that the vast resources of all India can be quickly transferred to either right, left, or centre of the frontier.

We can now turn our attention to the possible lines of advance by Russia.

From the map it will be seen that Russia has two single lines of railway leading towards Afghanistan—one from the Caspian to Merv, and the other from Moscow viâ Orenburg to Tashkend.

From Merv another single line runs to Bokhara and Samarkand to join the Tashkend line, and is extended eastwards to Andijan.

The Merv line also has a branch running south to Kushk on the Afghan boundary just 70 miles from Herat.

These railways are all single lines on the standard Russian gauge (5 feet), and, together with the assistance of navigable steamers on the Oxus (navigable as far as Termez), complete the available lines of communication for Russia towards Afghanistan.

Enough information has now been given on which to base considerations of policy or strategy in the event of an advance of Russia towards India.

There are practically only three lines of defence for India to choose: firstly, the line of the River Indus; secondly, the mountainous belt flanked by the lofty ranges trending south-west from the Pamirs and continuing southwards to the Suliman Mountains and the Arabian Sea; and, thirdly, the Hindu Kush and its prolongations to Herat.

The first line would constitute purely passive defence, enable Russia to consolidate her power over Afghanistan, and advance slowly in her own time after benefiting by the state of chaos which would be certain to arise in India itself. Apart from these reasons we are now bound by treaty to preserve the integrity of Afghanistan, and under no circumstances could we contemplate its absorption by Russia, more especially with a view to the political effect it would have on the Indian people.

The Indus, therefore, is a line to be strengthened, but not as our main line of defence.

Turning to the second line, or belt of mountains from Chitral to Karachi, we find that this line of defence has been advocated by many able authorities, but has been rejected by the majority of those capable of judging, principally on the ground that unless the issues from these passes on the Afghan side are held, it would still allow Russia to consolidate herself in Afghanistan and we would not be able to preserve the integrity of that country.

It has now been generally accepted, therefore, that in the event of our ally the Ameer being unhappily attacked, the strategic position we must take up at once would be the Kabul-Kandahar front.

Under this supposition we can now appreciate the Russian position as it would probably appear at the outset of operations.

From the description already given of the western Hindu Kush passes and the Pamirs, it will be recognised that it is most improbable that any effective striking force could ever succeed in making its way into Kashmir or India north of the Khyber Pass. With reference to the passes contiguous to Chitral it is interesting to note that Sir T. Holdich says: "Chitral was never historically on the high-road to India from High Asia, and never will be."

It may be argued by some that Russia can advance eastwards into China by crossing the Sarikol range either by the Beijik Pass (15,000 feet) or the more northern one, the Nezatash (see Map XIV.), from the Aksu (Murghab) Valley, but they would still have that invincible barrier, the Muztagh range, between them and India.

This would no doubt give the Russians a possible route towards Thibet, but nothing more, and that could not be construed into a menace to India.

Any advance of Russia through Baluchistan by the country south of the Helmund is also, from the nature of the country, equally improbable. (See page 32, Chapter II.)

Therefore, there are only two practical lines of advance open to any Russian force—that viâ Herat or Kandahar, and that by the passes over the Hindu Kush near Kabul and directed on the latter.

This, however, divides the Russian forces advancing along both routes simultaneously by the great block of impracticable mountain country, the Hazara highlands. The two columns would have no power of junction and would be compelled to operate on widely different lines: the military road already mentioned connecting Kabul and Herat is almost impassable for most months of the year. Based on Kabul we should therefore, with the aid of the Afghans themselves, defend that part of the Hindu Kush, while on the south and west we might possibly take advantage of the strategical position of Seistan on the flank of a Russian advance.

Seistan, once the granary of Asia, is still capable of furnishing considerable supplies, and the extension of the railway from Nushki to Seistan may still be considered by some authorities a desirable strategic advantage. (See page 33.)

Indeed, this is not the only railway the construction of which might be considered advisable in order to strengthen this frontier defence, but economic reasons, or the fact that the Afghans cannot be persuaded to allow railways into their country, have hitherto delayed their construction.

It must not be forgotten that military operations such as have just been discussed would indicate war with Russia not only in Afghanistan but all over the world, and that the Anglo-Japanese alliance would give us most powerful allies, capable of making their pressure felt both on the high seas and in Eastern Siberia.

Turning to the north-east boundaries of India we find a wild mountainous boundary-line, commencing with the south-east corner of Thibet, which seems to attract or include nearly all the large rivers of Asia.

Here we see those great rivers, the Yang-tsze-Kiang, the Me-Kong, the Salween, the Irrawaddi, and the Brahmaputra, all converging to a space not 200 miles across, yet some of their mouths are more than 2,000 miles apart (see Map XVII.). The boundary of Burmah here marches with those of Thibet and Yunnan (both Chinese) continues for about 100 miles with that of French Indo-China, and ends up with that of Siam.

The Himalayas themselves and the country to the north-east of Burmah must always prove a great obstacle to any military operations or movements which have to be made across them.

The British Expedition to Thibet in 1905 took the route from Darjeeling viâ the Chumbi Valley and Gyangtze to Lhasa (see Map XIII.). The route was exceedingly difficult and could only have been traversed successfully by a well-organised force of moderate size.

There are a few similar kinds of rugged and difficult crossings elsewhere on this frontier, but none that can be considered of any political or strategical importance at present. In Burmah the railway and river give ready communication from Rangoon right up to Myit-Khyma on the Upper Irrawaddi, and a branch railway runs to Lashio, near the Kunlong Ferry on the Salween, and Chinese commerce in those districts is increasing (see Map XVII.).

ASIATIC TURKEY AND PERSIA

(Maps XIII, XIV, XV, and XVI)

Although Asiatic Turkey and Persia are at present administered by governments not renowned for stability or reliability, these countries occupy such a position on our highway to India that it is all-important for us to study them closely and watch all developments which may affect our military status in the East.

The northern part of Persia is practically Russianised at the present day, and although the

1907 Anglo-Russian Treaty limits Russia to extending a similar influence south of the Zulfikar-Yezd line, too much reliance must not be placed on changes not being introduced in future years, and we must ever be alive to the fact already discussed, that since the advent of railways, the easiest and best approach for an invading force by land on India lies through Seistan. This, of course, is only possible by Russia establishing herself for some time in that locality as a starting-point or advanced base, and with a railway and improved roads leading to it from the north.

We cannot be certain how far the same treaty will stay Russia's hand in the future and prevent her pressing down to the Persian Gulf and establishing herself there; though in the near future this does not appear a practical policy for that country without more naval power than she possesses at present, still future possibilities must be considered and discussed.

We also see Germany making peaceful conquests of Asia Minor, and her financiers pushing railways eastwards towards the Persian Gulf, but in this case well backed up by both naval and land forces.

Our considerations will therefore be confined to the possibilities of such or similar powers establishing routes along these countries which might eventually be utilised to threaten our military status in the East.

The Sultan of Turkey, in addition to the territory he holds in Europe, also rules over the Arabian coast-lands and the contiguous regions between the Persian Gulf and the Mediterranean.

These latter may be divided into three parts—Asia Minor, Syria, and the Euphrates-Tigris Valley.

That part of Asia Minor lying between the Black Sea and the Levant is furnished with natural harbours, of which the principal one is Smyrna. Generally speaking, Asia Minor is a plateau between 2,000 and 3,000 feet high, edged by mountain ranges and falling by successive terraces to the Black Sea and the Mediterranean. The principal mountain range is the Taurus, running like a great barrier across the peninsula from the corner of the Mediterranean near Cyprus in a north-easterly direction. It is this barrier which in history has always been an obstacle in the passage of armies from West and East and vice versa, but seldom a successful one, and at the present day it is delaying the advance of the Baghdad or Anatolian railway. (See page 183.)

The object of this railway, which is undoubtedly the project of German diplomacy, is to connect by rail the eastern end of the Mediterranean with the Persian Gulf.

It is unnecessary here to consider its commercial success or failure, but as things at present stand it seems probable that it will eventually, at some distant date, become a *fait accompli*. How will it then affect our Eastern possession from a military point of view?

The main line (gauge 4 feet 8½ inches) starts at Scutari and runs to Konia and Eregli (just north of the Taurus), and is connected by a branch to Smyrna. (See Map XV.)

There is also a short line (gauge 3 feet 3·37 inches) already constructed from Mersina on the Mediterranean to Adana, both south of the Taurus.

The route for the extension of the Baghdad railway is still problematical, but it will probably pass through Adana, Aintab, Killis, Tel Habesh, Birijik, Mosul, and, following the line of the Tigris, reach Baghdad, and thence run to Busra, along the right bank of the Euphrates.

Eventually an endeavour may be made to secure a terminus at Koweit or some other point on the Persian Gulf. (See also page 183.)

This gives roughly a distance of 400 miles of main line from Scutari already constructed, and 1,200 miles still to be constructed before the Persian Gulf is reached, but as the Taurus and two other ranges of hills and the permanent swamps south of Baghdad have still to be negotiated, a very considerable time must elapse before the project can be completed.

There are really no good natural harbours anywhere in the Persian Gulf. Koweit is the most promising, but, though having considerable anchorage room, its approaches are difficult; it is now, however, well buoyed by the British Indian Steam Navigation Co., whose steamers call there periodically. Koweit is also the converging point for several important caravan routes from south, west, and north. The Sheikh of Koweit is under treaty obligations with the Indian Government in respect of Koweit and its vicinity.

Assuming that the railway is completed and that a terminus on the Persian Gulf is secured, it would possibly interfere with our present trade supremacy in that part of the world, where we have taken the lead for over three centuries; still it scarcely advances the feasibility of a land invasion of the western frontier of Afghanistan, considering the nature of the country which lies between this frontier and the Persian Gulf. The danger to be anticipated from a strategic point of view would appear, therefore, to be solely confined to the question as to how far our naval supremacy in the Gulf is to be affected, as it is obvious that any naval establishment of a foreign power capable of harbouring in safety battleships and torpedo-boats on the flank of our communications between the Red Sea and India would be a distinct danger; and this our Government would appear fully to recognise, for they have formally declared that it will always be our policy to maintain our naval predominance in the Gulf. It is to be hoped, therefore, that whatever terminus on the Persian Gulf is decided on for this railway, our diplomatists will safeguard our military or rather naval interests in the future by letting it be understood that no protective or military works of any kind connected with it can be allowed except those under our own control.

Let us now consider the nature of the country lying between the Persian Gulf and the frontier of Afghanistan.

The chief features are the two immense deserts, the Dasht-i-Kavir, and the Dasht-i-Lut, which practically divide the Mashad, Birjand, and Seistan provinces from the west (see Map XIV.). They stand at an average elevation of about 2,000 feet, and the country to the west and north of them becomes mountainous, with altitudes of 10,000 to 12,000 feet. About 50 miles south of Kerman a peak rises to 14,500 feet.

The strike of all the mountains in this part of Persia runs north-west and south-east; any routes there are, therefore, run in the same direction.

The communications in Persia at present are very bad. There are no navigable rivers except the Karun, which flows into the Shat-el-Arab at the head of the Persian Gulf, up which steamers run as far as Ahwaz. The routes in the south can scarcely be called roads, but lie along well-defined directions.

From Bushire the road runs to Shiraz and Ispahan and on to Teheran.

From Ispahan a road runs south-east to Yezd, Kerman, and Bam (500 miles).

From Bandar Abbas a road runs to Kerman (400 miles), and another road from Kerman to Nasirabad on the Seistan frontier (300 miles), and another from Bam to the same place (250 miles).

The Province of Khorasan lies in the north-east, the capital of which is Mashad, a prosperous town only 75 miles as the crow flies from the Krasnovodsk-Merv railway.

A Russian naval station exists at Ashurada in the Bay of Astralad at the south-east corner of the Caspian Sea.

Sir T. Holdich (in his "Gates of India") points out that in addition to the comparatively easy route to Seistan from Merv, viâ Herat, there is a feasible route from Mashad to Seistan (presumably through Birjand), and were it not for the political considerations arising from the respective geographical positions of these two routes, one lying within Persian territory, and the other being Afghan, they might be regarded as practically one and the same. Neither of them could be used without the occupation of Herat, and most assuredly, should circumstances arise in which either of the two should be used (in the same aggressive sense), the other would be utilised at the same time. Preliminary, however, to any immediate attack on the frontier of India no large bodies or armies could be maintained or supplied without the establishment of railways along these routes, and the same may be said of the routes from the Oxus about Termez towards the Hindu Kush passes near Kabul; but such railways, in the mountain regions, could not be made rapidly or be of the ordinary nature of quickly constructed military lines, as they would encounter great rises and falls over difficult country, and this would entail a Russian occupation of both Persian and Afghan territory for months or even years before any serious advance by land on India itself could be made.

CHAPTER VI

THE FAR EAST

(Maps III, XI, XII, XIII, and XVII)

THE history of the 1904 Russo-Japanese War and the events which led up to it are fully dealt with in other books; but in any considerations regarding the relations of these powers it is necessary to bear in mind, the primary causes of the war lay in the fact that the immense continent of Russia in Asia (more than 3,000 miles from west to east) has no ice-free port giving access to the sea.

South of Vladivostock, any port in Korea on the Sea of Japan was open to the objection that Japan dominated the Straits of Korea leading to it. Port Arthur offered the necessary facilities, and, moreover, its approaches lay entirely in Manchuria, where Russia had already established herself; this port was accordingly leased from China, but the insidious advance of Russia into Korea eventually led to war with Japan.

The vast region included by Siberia is the chief Asiatic possession of Russia. Much of it can hardly be called civilised at present, but the commercial future of the southern part of the country has immense possibilities.

Its boundaries are Russia in Europe, the Arctic Ocean, the Pacific, the Chinese Empire, and Russian Central Asia.

It is larger than Europe, possesses all kinds of soils, many kinds of climates, and the most varied products. It has enormous pastures, with food for millions of cattle, as well as rich mines, but its population is small compared to its area, being only about 1 person per square mile, comparing badly with Russia in Europe, which has 51 per square mile. The advent, however, of the Trans-Siberian railway is rapidly increasing the population. In fact, the colonisation of this part of the world is increasing yearly by leaps and bounds.

Most of the country is a vast plain, which slopes uniformly downwards in a north-westerly direction.

The mountains lie in the south-east portion, and the best-known ranges are the Altai, the Yablonovoi, and the Stanovoi; they have a mean altitude of about 5,000 feet, with crests double that height. The last of these ranges forms the great divide between the basin of the Amur and the basins of the Lena and other rivers which run into the Arctic Ocean.

The four great rivers of Siberia are the Obi, the Yenesei, the Lena, and the Amur, all practically about 3,000 miles long. Unfortunately, the first three of these rivers have their heads turned the wrong way and flow into a frozen ocean; their upper course is ragged and rough, their middle course is through primeval forest, and their lower course is stopped by ice for nine months in the year; their value for navigation is therefore considerably discounted; their tributaries, however, which flow east and west in Middle Siberia, give great facilities for local traffic (see Map III.). The Amur is only partly in Siberia, as its sources lie in Mongolia, and its largest tributary, the Sungari, belongs to Manchuria. Both the Amur and Sungari are navigable for light-draught steamers, the former for about 2,000 miles to Stretynsk, and the latter to about Harbin. The Amur is frozen from December to May.

Although these great waterways, connected by canals, form the chief arteries of communication and give roads for traffic, even when frozen, into the very heart of the country, the Trans-Siberian railway is destined to increase these facilities for movement eastwards and westwards to such an extent that the conditions for Russia's military advance towards the Pacific must be greatly altered and improved in the future.

Were it not for the great rivers, water would be scarce, as there is a very small rainfall. The cold is intense in winter, but varies according to latitude, and the summer is short but hot.

Vladivostock is the only Russian naval station on the Pacific; it is strongly fortified, but is ice-bound from December to April. As has been already pointed out, its approaches are dominated by Japan.

The Japanese island of Tsushima, strongly fortified and affording a base for torpedo-boats, divides the Korean straits into two channels, 25 and 27 miles wide.

Starting by several connections with the railways in European Russia, the Trans-Siberian railway runs on a 5-feet gauge eastwards to Lake Baikal (which it skirts to the south), passing the towns of Omsk and Tomsk en route (see Map III.); from thence running still eastwards till it reaches Chita, just beyond which it strikes across Manchuria to Vladivostock (Russia's only naval station in the East); and at Harbin a branch runs down to Port Arthur. From Vladivostock another branch runs north to Khabarovka on the Lower Amur. Another branch leaves the main line just east of Chita, runs to Stretynsk on the Amur, and is being constructed to follow the line of the Amur till it joins the line already mentioned at Khabarovka, which will then complete an all-Russian railway to Vladivostock.

On the Harbin-Port Arthur line a branch runs to Tsing-min-tin, and thence south to Kin-chau and Tientsin.

Another branch leaves the main line about 30 miles south of Mukden and runs into Korea.

Another branch connects it with Niuchwang, and thence joins the Tsing-min-tin-Kin-chau line.

In 1904 this great line of railway (the Trans-Siberian) was only a single line, very imperfectly constructed (with a break at Lake Baikal), and imperfectly provided with rolling-stock and engines. The total distance from Moscow to Harbin is about 5,100 miles (and to Vladivostock another 400), and at the commencement of the campaign it was capable of despatching only about four trains a day each way, at an average speed of about 15 miles per hour.

In spite of these difficulties Russia was able to transport and maintain nearly a million of men in the field.

Since then the Lake Baikal gap has been closed, the permanent way has been improved (and in some places it is being double-tracked[1]), and the rolling-stock increased, so that its capacities may be said to be trebled. (See also page 185.)

When Russia has increased her colonisation along this railway, pushed out innumerable branches from it, and perhaps established military centres for her supplies of personnel and matériel, it does not appear improbable that she will again seek advantages and concessions from China, or an ice-free port with a practical outlet to the ocean, which is still denied to this immense and growing country both in the Near and the Far East.

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[1] The double-tracking of the line from Omsk to Chita will be completed in 1912.

Manchuria was the theatre of war in 1904–5, and for years to come it must still remain a danger-spot.

It will be interesting, therefore, to investigate a few of its geographical features.

Manchuria, theoretically, belongs to China, and up to 1905 was practically dominated by Russia; at present Russian control only extends to Changtu, between Harbin and Mukden, and the Japanese dominate all south of this, including Korea.

Port Arthur stands at the end of the Liao-tung peninsula. It is not a large harbour, its dock accommodation is very limited, and the entrance to the harbour is narrow and obstructed by sandbanks; it is, however, open all the year round from ice, but is 400 miles up the Yellow Sea, which narrows there to about 60 miles.

The boundary of China Proper and Mongolia with Manchuria runs parallel to and about 50 miles from the Port Arthur-Harbin railway. The Liao-ho river runs from about west of Mukden, just inside this boundary, and flows into the Gulf of Liao-tung at Niuchwang; the river is navigable for 200 miles, but is closed by ice from November to April.

The boundary between Korea and Manchuria is marked by the rivers Yalu and Tumen, rising near one another and flowing in opposite directions. The former is navigable when free from ice for about 50 miles from its mouth.

Immediately west of this boundary and extending from Port Arthur to Kharbarovka on the Amur lie ranges of mountains; these, though not very high, form a serious obstacle to movement. The plains to the west of them are flat and richly cultivated, seamed by rivers running westwards in deep muddy beds into the Liao-ho, and studded with strongly built native villages. No roads worthy of the name exist in the country. So-called roads run along the eastern coast of the Liao-tung peninsula from Dalny to Antung and along the western coast from Port Arthur to Liao-Yang and Mukden. Another road leads from Antung at the mouth of the Yalu over the mountains by the Motienling Pass to Liao-Yang. There are of course many tracks, but none of these communications are suited for the passage of the wheeled transport of an army. In winter they are frozen hard and comparatively easy to traverse, but the climate there is almost too severe for military operations. During the thaw, about April, they become nearly, if not quite, impassable. In the summer rains (July and August) they are equally difficult. In the dry summer months they are heavy with dust and ruts.

The position of Korea, lying between the Yellow Sea and the Sea of Japan, was the original bone of contention in the 1904–5 war (see Map XVII.). It is about 400 miles long from Fusan to the Lower Yalu and averages about 130 miles wide. It is mountainous and difficult to traverse, but a railway now runs from Fusan to Seoul (the capital) and by Angu to Wiju, and thence straight to Yentai, where it joins the main Port Arthur-Mukden railway about 30 miles south of the latter place.

The eastern coast of the Korean peninsula is generally precipitous, with few bays.

The western coast is deeply indented with several harbours. On the southern coast there is a good harbour at Masampo and another harbour at Fusan.

Korea is now (1910) annexed to and forms part of the Japanese Empire. In future it is to be officially designated Cho-sen.

JAPAN

Japan (or the Country of the Sun) has many points of analogy and resemblance to Great Britain. Both are insular, with countless inlets on their shores; they are both well situated for commerce, provided with good harbours, with good coal supplies, and have become great naval powers. It is unnecessary to go far into the details of this country, as it is unlikely itself to become a theatre of war in the near future. We know it has made unparalleled progress in civilisation and military and naval strength within the last forty years, and its successes in war have proved that it is a great power with great military resources, which must be reckoned with in all questions connected with the Far East, and its alliance with Great Britain should strengthen the position of both countries in holding their own. But this alliance, from its wording, in no way appears to tie the hands of either contracting party in acting as they should deem advisable in the event of either party themselves initiating an attack on the territorial rights of another nation. Japan's geographical position is one, however, which must for all time influence Far Eastern questions, for it will be observed that her dominions form one continuous chain or belt extending from the centre of Saghalien and Cape Lopatka (the southern point of Kamschatka) right down (through the Luchu Islands) to Formosa and the Pescadore Islands. It is impossible to approach from the Pacific any port of Asiatic Russia (except in Kamschatka), Manchuria, Korea, or China north of Canton, without breaking through this Japanese chain, the openings in which are never more anywhere than 120 miles. It is a matter of congratulation for Great Britain that Hong Kong lies outside the chain; but these geographical facts must always impress themselves very deeply on Eastern questions both political and military, and especially on naval affairs in general, where narrow waters can be dominated by the installation of torpedo-boat centres.

Although Japan consists of hundreds of islands, there are only six of large extent or importance, namely, Honshu, Shikoku, Kyu Shyu, Hokkaido, Formosa (Taiwan), and Saghalien (Karafuto). Of these by far the largest and most important is Honshu, which is situated in the middle of the chain, extending from north-east to south-west.

Owing to the prevalence of moist winds coming from the sea, the rain-gauge in Japan records a height far above the average in other countries. The west coasts of Hokkaido and Honshu are often covered with dense fogs. There are two wet seasons, each of one month's duration—in June, and again in September.

The coast-line of Japan is 18,340 miles in length (omitting Saghalien), having a proportion of 1 mile of coast-line to 8 square miles of area. On the Pacific coast the geological formation is more broken, and the result has been the forming of many bays and gulfs, while on the Japan Sea, or western coast, the comparatively unbroken line affords few sheltered harbours or safe places for open anchorages. It naturally follows that trade has gravitated to the area washed by the Pacific.

Formosa lies partially in the tropical zone. A chief range of mountains, running from north to south, divides it, generally, into two parts; the west side sloping gently to the sea, while the east is rocky and precipitous. The snow-clad peak of Nutakawaga stands in the centre of the island, and is the highest peak (14,270 feet) in the whole of Japan. Formosa is volcanic, and full of hot springs.

The primary naval ports in Japan are Yokosuka, Kure, Sasebo, and Maizuru.

The secondary naval ports are Takeshiki and Ominato.

The chief military arsenals are at Tokyo and Osaka. At Uji powder is manufactured.

The Japanese at present possess no fortresses. The landward defences of Port Arthur remain as they were when the siege ended in 1904. On the other hand the coast defences of the home territory are well maintained, and a law exists to define the duties of the army and navy in relation to them. The chief coast defences are those of the Inland Sea, and of Tokyo Bay. The four passages into the former are strongly defended, while Kure and Sasebo have defences of their own, and there is a central position within the Sea.

Tsushima, Nagasaki, Maizuru, and Hokodate are also fortified.

Generally speaking, from a military point of view, any one is justified in saying that Japan is twice as powerful now as she was when she challenged Russia in arms (1904).

Up to the present Japan has only had two kinds of railways, those of a 3 feet 6 inches gauge, and tramways laid on highways.

The new legislation, however, provides for three classes, namely, a standard gauge (4 feet 8½ inches), light railways, and tramways. All the railways are nationalised and under State control.

It cannot be ignored that the existing naval and military supremacy of Japan in the Far East might be utilised in an endeavour to secure predominance in the Pacific, to seize the Philippines, Hawaii, and Samoa from the United States, and even to obtain a footing on the western shores of America. Such ambitious schemes are ably discussed in General Homer Lea's book "The Valour of Ignorance," and in it the geographical advantages to Japan of the Philippines and Hawaii are fully advocated. The great value of Hawaii is due to the fact that it is almost in the centre of the Pacific, and that the nearest ports are 2,000 miles away. It severs the North Pacific from the South, and the East from the West. In the future its possession, together with Samoa, will probably fall to the nation holding command of those seas, as there are no land defences attached to them worthy of the name. Should Japan ever become possessed of these important bases she could fight a naval battle anywhere on the Pacific trade routes, and always be within three days' steaming of not less than two divergent bases. (See "Naval Bases," Chapter I.)

The United States naval base at Hawaii is at Pearl Harbour, about 7 miles from Honolulu, to which there is a cable from San Francisco and Manila.

The United States base in Samoa is at Pago-Pago, a fine and naturally well-protected harbour in the island of Tutuila.

CHINA

Far Eastern questions are so bound up with the future development of China and its people that a study of Chinese dominions cannot be dispensed with.

It is only proposed here to note very briefly certain facts and prominent features connected with China to enable the reader roughly to appreciate the existing geographical state of affairs and relations of the different countries interesting themselves in the Chinese Empire.

The Chinese Empire fills more than one-fourth of Asia (see Map III.), and consists of the following divisions, together with their estimated population per square mile:

China Proper	270	per square mile.
Thibet	8	" "
Chinese Turkistan	2	" "
Mongolia	2	" "
Manchuria	44	" "

They vary very greatly in density of population, but in Mongolia and Chinese Turkistan the long stretches of the Gobi Desert from north-east to south-west are never likely to encourage much increase in either country. This great desert belt, stretching practically from Manchuria to Kashmir, is a very interesting obstacle to any advance across it, either on the part of Russia or on the part of the Chinese, but it has already been pointed out that railways are the conquerors of deserts, and, as far as communications are concerned, the Gobi may not prove any exception to the rule.

From Russian Turkistan to Kashgar in Chinese Turkistan there are two principal routes: first, a route available for pack-animals only from the railway at Andijan viâ Osh and Gulcha to Kashgar (see Map XIV.); and, secondly, the important cart-road which leaves the Tashkend-Orenburg railway at Kabulsai (just north of Tashkend), passing by Pishpek, Tohmak, and Kutemaldi (on the Lake Issik Kul) to Narin (see Map XIII.), a total distance of 544 miles, and thence enters China by the Turgat Pass (see Map XIV.), reaching Kashgar in ten stages. All Russian officials travel this way. East of Tohmak is Verny (Viernoe), a city connected by cart-road with Kuldja in one direction, and Semipalatinsk in the other. Verny will eventually become an important railway centre (see page 187 Chapter VIII.).

One of the chief towns in Mongolia is Urga (or Great Camp); just immediately north of it, and not far from Lake Baikal, is Maimachin, which is on the Russian border.

The great Chinese route between Pekin and Siberia at present runs across the desert from Kalgan to Urga and Maimachin. (See Map III. and pages 155 and 187.)

The Russians already have made proposals for a railway to follow this route. (See Chapter VIII.)

West of Urga the grass-lands are celebrated, and Kobdo is the entrepôt of the Russian dealers from the Altai mines.

In Chinese Turkistan we also see little to encourage an increase of population. The climate is severe—a cold winter follows a burning summer, and the summer and autumn are rainless; moreover, the air is constantly charged with dust and sand. Its only river, the Tarim, is nearly as long as the Danube, taking its rise in the Pamirs as the Yarkand River; but it becomes smaller and smaller as it approaches Lobnor, the last remnant of an ancient sea.

Thibet (or the Snowy Kingdom) is the elevated country lying immediately north of the Himalayas, and therefore of immediate interest to our Indian Empire. It is the loftiest table-land on the face of the globe, and its inhabitants breathe an air which has less than half the density of our own. The only large town is Lhasa, the government of which is dominated by the Chinese.

China Proper, with its vast, rich, and densely peopled country, about half the size of the whole empire, has immense possibilities in the future. It is for the most part mountainous, especially in the west and south. In the west, very high ranges running north and south; north of the Yang-tse-Kiang, lower ranges and a vast fertile plain; and south of the river, ranges of mountains running from east to west,—such is the build of China. From the Gulf of Liao-tung to the valley of the Yang-tse-Kiang stretches the Great Plain of China, one of the vastest and richest lowland plains in the world. The chief wealth of the plain consists in the immense quantities of rich yellow earth called "loess." In these regions everything is yellow, even the vegetation being covered with a yellow veil of dust. The Hoang-ho, or Yellow River, takes its name from the deposit of yellow earth which it brings down with it. It is 2,000 miles long, rising in Thibet, and falls into the Gulf of Pechili; unlike the more southern rivers, it is of little use for general navigation.

The Yang-tse-Kiang, or Blue River, is the largest river in China, also rising in Thibet, and is navigable up to Chung-King, 1,500 miles from the sea. At Hankau (700 miles inland) it is a mile wide. It forms the chief means of communication into the centre of China; and near its mouth stands Shanghai, the chief commercial mart of the empire.

The Si-Kiang or Canton River, is the great waterway of the south; it rises in Yunnan, the Chinese province adjacent to the Burmese frontier, and after running for 1,100 miles forms a navigable delta at its mouth, on which is situated Canton, the foremost among Chinese cities for its industries.

Pekin is the capital, standing about 12 miles from the Peiho river, its port being Tientsin, in the Gulf of Pechili.

Great Britain possesses the island of Hong Kong at the mouth of the Canton River; and has leased the Kowlung Peninsular District on the mainland opposite (about 40 miles long). Great Britain has also leased Wei-hai-wei on the Shantung Peninsula, opposite Port Arthur (see Map XVII.). Japan holds the lease of Port Arthur and Talienwan on the Liao-tung peninsula.

Germany holds Kiao-chau as a protectorate under a lease with China (signed in 1898). The territory ceded with the town stretches about 160 miles along the coast, and a neutral zone surrounds the district and bay. A dock is being built, and it is being made a fortified coaling-station.

France leases Kwang-Chan-Wan (opposite the island of Hainan) and two small islands which guard the entrance.

Portugal possesses Macao, an island at the mouth of the Canton River.

China Proper is intersected in every direction by Imperial highways which, with the great number of navigable streams and the extensive system of canalisation, render the country exceedingly rich in communications. Many of the roads, however, are in a very bad condition, and in some places are only 3 or 4 feet wide.

Railways.—The Manchurian railways have already been referred to.

The most important railway in China is that from Pekin to Hankau (750 miles, gauge 4 feet 8½ inches), with a bridge over the Hoang-ho, or Yellow River, 339 yards long (see Map III.). There are branches from Chingchou to Kiafeng-fu (35 miles), and from Kaifeng-fu to Honan-fu (120 miles), and from Chentou to Tai-ynan-fu (130 miles). There are also the following:

Pekin to Kalgan	125 miles.	
Pekin to Mentokow	17 „	
Tsing-tau (near Kiao-chau) to Tsinan	250 „	(under German direction).
Shanghai to Nanking . . .	200 „	
Canton to Shao-chou-fu . . .	120 „	
Canton to Kowloon	100 „	
Laokai to Yunnan-fu . . .	300 „	(See Map III.)

This latter line is of importance to note, as it is an extension of the French line in Tonkin, starting at Haiphong on the coast, and completes communication by rail from the China Sea to the capital of Yunnan, which lies about 300 miles from the eastern frontier of Burmah.

The following railways are under construction: Kalgan to Sui-Yuan-Ting near Kwei-Hua-Cheng

(250 miles), Canton to Hankau (650 miles), Tientsin to Nanking (600 miles), and Shanghai to Ningpo (238 miles). (For "Projected Railways" see page 186.)

Coal is abundant in the province of Shanti, which some authorities consider to be the greatest undeveloped coal-field in the world.

All important railways in China are on the 4 feet 8½ inches gauge, except the Russian-Siberian (5 feet) and the French (metre).

The future of China seems to centre on the future development of its railways. Improved means of communication is the crying need of the country, but the Chinese Government have not yet adopted any *modus vivendi* by which the various syndicates and foreign governments can be allotted and secured rights of construction and control which they are all competing among themselves to obtain. Indeed, serious complications have already been created between the financial groups of Great Britain, France, Germany, United States, Russia, and Japan, which have caused the governments of these powers, and must continue to cause them, no little anxiety. We must note, however, that the present position of affairs in Manchuria clearly foreshadows the extension of Japanese predominance in that country, from the control of the thin lines of steel to ever-widening spheres of activity, and it is not surprising that the other powers, together with

Japan, should endeavour to repeat the operation of conquest by railway in other parts of China.

With 5,000 miles of coast-line well provided with rivers and ports, fertile plains, and a teeming and industrious population, there would appear to be all the geographical requirements for the rise of a great nation. Who can say, therefore, what the future may develop in the Far East?

Comparing them with the Japanese some authorities well able to judge consider the natural capacity of the Chinese as equal to that of the Japanese if not fundamentally superior, and that they are quite as intelligent and physically larger, and we know that they displayed military characteristics of no mean order under General Gordon.

It cannot be denied, therefore, that progress in good government and military organisation might in future years develop a real offensive power in this part of the world which the Western Powers would be wise not to ignore.

The conditions, however, for promoting to practical politics what is sometimes termed the "Yellow Peril" have yet to be brought into play, and it is a satisfaction to the white man to consider that, even when the power is created, there will always remain the great physical obstacles pointed out by military geography lying on the land side between the Far East and West, which even a Great Power in the former would have to cross before reaching the latter.

It is different, however, when we come to consider the geographical position of Japan with reference to the American continent, and more especially the United States of America.

The shores of these two powers are only separated by about 5,000 miles of sea (or about fourteen days' steaming), and with the existing Japanese military and naval resources the passage of an army over this space in a comparatively short period of time cannot be said to be outside the area of practical politics.

CANADA

(Map XVIII)

Lord Dufferin described Canada as follows: "A domain nearly as large as Europe stretching from the Atlantic to the Pacific, with its southern extremity in the same latitude as France and its northern boundary along the shores of the Arctic Ocean. Possessing the finest forests in the world, widely spread coal-fields, most extensive and productive fisheries, watered by the most remarkable natural distribution of lakes and rivers, enriched with all varieties of minerals, and possessing enormous areas of fertile prairie-lands destined to become the future granary of England, this vast country reaches nearly 3,000 miles (as the crow flies) from ocean to ocean."

The Rocky Mountains in the west average about 10,000 feet in height (with passes from

4,000 to 5,000 feet), and from them the principal rivers flow eastwards, the more important amongst them being the Saskatchewan (1,900 miles long) and the St. Lawrence.

The important lakes are Lake Winnipeg, the Lake of the Woods, Lake Superior, Lake Huron, Lake Erie, and Lake Ontario.

Montreal is the largest city in Canada, and is the commercial and financial centre of the Dominion.

The south boundary of the Dominion marches from east to west with that of the United States, commencing with the St. Croix River (Bay of Fundy) and, passing 40 miles south of Montreal, afterwards follows the water-lines of the lakes and rivers up to the Lake of the Woods, from which it follows the 49th degree of latitude.

The essential and more important part of the country lies in a belt stretching from east to west in an elongated position along the southern border, exposing itself to invasions from the south along a front of over 2,000 miles.

Its large and important centres, such as Montreal, Quebec, Winnipeg, and Vancouver, lie very close to the United States frontier. At the same time there are some geographical features which compensate to a certain extent for these military disadvantages.

In the first place it will be observed that although the United States boundary on the east bends northwards and tends to encircle or flank

Eastern Canada, giving what has already been referred to as a re-entrant form of frontier to the United States, the strategic advantages with the latter country are discounted by the fact that there is no room for movements between the frontier and the sea (as it averages only about 120 miles across, and is divided east from west by Lake Champlain), and a force friendly to Canada landed on the east coast would be a serious menace to a force from the south operating along the line of the River Hudson. The St. Lawrence itself also affords opportunities for naval activity, except in winter, when it is frozen over (opening about the middle of May).

In the winter the cold is so intense throughout Canada that military operations could only be carried on under exceptional difficulties. The chief difficulty is not so much due to the effect of the low temperature on the troops as that of transport over the soft snow. The ports in the Bay of Fundy, Halifax, and Prince Rupert, are always open.

The line of the St. Lawrence and the Great Lakes right up to Lake Winnipeg constitute a very formidable military obstacle along this part of Canada's southern frontier, and any invasion across here would probably entail an advance over very narrow fronts. (See also page 176.)

The country between Lake Superior and Lake Winnipeg is so broken up with rivers and small lakes that operations across it in face of any opposition would be most difficult.

As we get into the region of the Rocky Mountains we again find the country quite unsuited to operations and without any important strategic points.

Another asset in the defence of this frontier from the Canadian side is the exceptional facilities existing for lateral communications both by water and land. War-vessels can reach Quebec, and large Atlantic liners can reach Montreal, from whence lake-steamers run to Lake Superior. The Canadian Pacific, the Intercolonial, and the Grand Trunk Pacific Railways connect St. John, Moncton, Sackville and St. Andrews (on the Bay of Fundy), and Halifax, all first-class ports in the east, with Vancouver and Prince Rupert in the west, and both in Ontario and the regions south of Winnipeg there is a perfect network of railways.

The locations of the Grand Trunk Pacific and Canadian Northern Railways are situated farther to the north than that of the Canadian Pacific Railway, and therefore are not so liable to interference by raids across the frontier from the south. They make, therefore, a valuable strategic addition to these lateral communications. (See also page 177.)

On the other hand, almost the whole frontier on the United States side is also very freely provided with railways, and especially those states immediately south of Manitoba.

We see, therefore, the vital or eastern parts of the country have great natural and artificial geographical features for defence or attack, though Winnipeg and its surroundings, lying only 60 miles from the frontier, have little or nothing in the way of natural obstacles to protect them from the south. Their distance, however, from Montreal is over 1,100 miles, and their occupation alone would still leave Eastern Canada untouched.

It is evident, therefore, the command of the Great Lakes is of the utmost importance to Canada, as without this Canada's vital centres in the east lose the natural advantages for defence referred to.[1] It is of interest, therefore, to note the terms of existing treaties regarding the upkeep in peace time of war-vessels on the Great Lakes. The treaty now being recognised is called the Rush-Bagot Treaty, dated 1817, between the United States and Canada. By it the naval force is limited on both sides to the following:

Ontario.—One vessel not exceeding 100 tons, armed with one 18-lb. cannon.

Upper Lakes.—Two vessels similar and similarly armed to above.

Lake Champlain.—One vessel similar and similarly armed to above.

The above treaty, however, does not prevent either country from preparing ships of their mercantile marine in peace time for use in the event of war, with the necessary armament, etc., available on shore to be shipped when required.[1]

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[1] The Great Lakes themselves remain open in winter, though the narrower parts (canals, rivers, etc.) are frozen.

With the exception of Lake Ontario the United States has at present a great preponderance over Canada in regard to size and number of ships, and while this fact exists, and the Rush-Bagot Treaty is recognised, one can only infer that the command of the Upper Lakes at all events must fall into the hands of the United States in the event of war.

Canada has an exceptional interest to Great Britain, as military forces might have to be despatched to Australia or the Far East, and if their passage was confined to British territory they could be sent across Canada by what is called the "all-red route" in a shorter time than if sent viâ the Suez Canal. (See page 213.)

The distances along the Canadian railways may be roughly taken as follows:

From Halifax to Quebec	400	miles.
From Quebec to Winnipeg	1,300	,,
From Winnipeg to Vancouver . . .	1,300	,,
Total from Halifax to Vancouver .	3,000	,,

or roughly four days by mail train.

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[1] The Duke of Wellington, writing to Lord Bathurst in 1825. recommended the maintenance of naval stations on the Great Lakes! (See page 94, "Canada and Canadian Defence," by Major-General C. W. Robinson, C.B. 1910.)

The gauge of all the railways in Canada and the United States is 4 feet 8½ inches.

The section of the Grand Trunk Pacific Railway from Edmonton to Prince Rupert will be finished in 1912, when communication will be complete by this route from the Atlantic to the Pacific.

CHAPTER VII

STRATEGIC WATERWAYS AND CANALS

IT has already been referred to in Chapter II. that in modern warfare, where railways exist, they have practically superseded water transport for military purposes in war time, and as Europe is practically covered with railways the great waterways will in future European warfare lose much of their former military glory. There are still many parts of the world, however, where great waterways like the Nile, the Irrawaddi, the Niger, the Congo, the Yang-tse-Kiang and the Amur, the Tigris, the Euphrates, the St. Lawrence, and others may still be of great strategical importance as military lines of communication.

With the exception of a few large canals, canals themselves are not likely to play a very important part in future wars, but they may assist and facilitate the transport of warlike stores, as for example the Rhine-Dartmund-Ems Canal, and others connecting the Westphalian coal-fields and Essen arsenal with the great German naval stations on the North Sea. Such canals, however, as the Manchester Ship Canal and similar canals in North Germany and other countries are, in the presence of railways, not likely to affect strategical problems to any great extent.

Only canals, therefore, of first-class military or naval importance will be referred to, and their commercial advantages need not as a rule be considered.

In Great Britain we have only one canal of first-rate importance, and that is still only projected. It is to connect the Forth and Clyde, viâ Loch Lomond and Loch Long, with a battleship canal. It is proposed to have only two locks, with a lift of 21 feet. It is to have 36 feet depth, and to the Clyde (south end of Loch Lomond) would be about 65 miles long.

The strategic advantages claimed for it are as follows:

(1) As a means to move warships from one sea to the other for concentration or attack more rapidly and with more safety than by the north of Scotland.

(2) To give more facilities to wounded vessels to be removed from the "danger-zone" in the North Sea to comparatively safe ports on the west coast, and thus relieve any congestion at the naval base at Rosyth.

In Germany the Kiel Canal has already been referred to. The Ems-Jada Canal connects Emden with Wilhelmshaven and at present allows passage to torpedo-boat destroyers (see Maps V. and VI.). It has been proposed to increase this to a battleship canal, but this proposal is in abeyance, and another proposal which has not yet been acted on is to connect the Jada Bay with the estuary of the Weser, on which Bremerhaven stands. Already in existence is the Ems-Dartmund Canal, which connects Emden with the Westphalian coal-fields at Dartmund, and this is being extended to the Rhine at Ruhrort; it will be 11 feet deep, and the locks will be 32 feet wide. This extension will be finished in 1915, and will greatly facilitate communication to the coast from Krupp's great arsenal at Essen. A project is also sanctioned to extend this canal to beyond Dartmund to Hanover, thus completing the connection for vessels of about 600 tons burden between the Rhine, Ems, and Weser.

There are many notable canals for barges connecting the great rivers in France and Germany (see Map IV.). The Rhine and Seine are connected by the Marne-Rhine Canal (viâ Toul and Chalons) (see Map IV.), and by the Canal d'Alsace (viâ Nancy and Strasburg); the Rhine and Danube by the Ludwig Canal, which, starting at Mannheim, joins the Danube (through Nuremberg) after a course of 110 miles; and the Seine with the Rhone viâ the Loire and Saône; being small and shallow, however, their principal uses must be mainly commercial.

The Bordeaux-Cetti Ship Canal is only projected, and in abeyance. It is to enable battleships to pass from the Bay of Biscay at Bordeaux to Cetti on the Mediterranean. At present there is a canal which, with the assistance of the Garonne, enables barges to accomplish the journey. It is, however, only 6½ feet deep, and has a total maximum rise of more than 400 feet above the Mediterranean. If any nation can accomplish such a great engineering feat, France can do it, and when completed it will enable her to concentrate her fleets rapidly and in safety, either in the Bay of Biscay or the Mediterranean.

Russia also has a similar great project to connect the Baltic with the Black Sea, but at present the scheme of making a large ship-canal has been abandoned, and it is contemplated to confine it to a more practical scheme on a commercial basis.

The Suez Canal has a total length of 99 miles, with a bottom width of 121 feet and a depth of 29½ feet. The depth is now being increased to 31 feet, which would then allow even a Dreadnought to make the passage.

In 1888 a convention was signed by Great Britain, Germany, Austria-Hungary, Spain, France, Italy, the Netherlands, Russia, and Turkey, by which these powers agreed that the Suez Canal shall always be free and open in time of war as in time of peace to every vessel of commerce or of war, without distinction of flag, and they agreed not in any way to interfere with such use or obstruct or blockade it and its ports of access within a radius of 3 miles from those ports.

The Panama Canal is the greatest of all waterway projects, more especially as it is in a fair way to be completed, and it is expected to be opened in 1915 (see Map I.). It is not proposed here to deal with it from an engineering point of view, but the strategic and economic changes which it will effect are so important that it is essential to note what its capabilities may be.

The status of the Panama Canal in war time differs considerably from that of the Suez Canal under similar circumstances, in that it is not at present neutralised, at least that is the claim made by naval authorities in the United States.[1] The facts put forward in support of this claim are as follows:

1. The Canal is owned by the United States Government as permitted by the Hay-Pauncefote Treaty, 1902. There is no company, there are no shares, and hence no government or citizen has any vested rights in the Canal, the treaty rights guaranteed to Panama alone excepted.

2. The construction, maintenance, operation,

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[1] Captain H. Knapp, U.S.N., in *U.S. Naval Institute Proceedings*, vol. 36, March 1910.

sanitation, and protection of the Canal belong exclusively to the United States Government.

3. Commercial freedom of transit is guaranteed. That transit in time of war is included is evident from the rules relating to belligerents.

4. Free transit of vessels of war is guaranteed.

From the foregoing it may be gathered that the free transit of vessels of war in time of war cannot be held to apply to enemies of the United States when the latter is a party to the war. If Great Britain should ever become hostile to the United States the treaty establishing the rules for the transit of belligerents in war time would be suspended by the existence of war and would not be recognised by the United States.

As things stand at present, the protection of the Canal in war time falls entirely on the United States Government. The United States War Office has recently made proposals to its Government for fortifying the Canal involving the expenditure of large sums of money, and it has been argued with much reason that even if this money is expended the Canal would still require battleships to defend it.

If it should prove to be true, as it is asserted by some naval authorities, that, even with the assistance of fortifications, it would be impossible for the United States fleet to pass through the Canal with a hostile fleet awaiting it outside, there would appear little strategic advantage accruing to the United States in the present arrangement.

While the fortifications could prevent a hostile fleet from passing through the Canal, yet in war time, if the Canal be not neutralised, an enemy might, without much difficulty, render the Canal inoperative, and thus place the United States in a worse strategic situation than if the waterway was neutralised and all parties were allowed free use of it.

In consideration of the above a large portion of public opinion in the United States seems to be favouring neutrality; but Mr. Roosevelt, in a recent speech (at Omaha), made the following statement:

"We are in honour bound to fortify it ourselves, and only by so doing can we effectively guarantee its neutrality, and, moreover, effectually guarantee that it will not be used against us."

It is understood that this view is also held by the present (1910) Administration.

The final settlement of this question therefore still remains open.

The total length of the Panama Canal will be about 49 miles, with a total rise of 85 feet, width at surface over 300 feet, and it will take vessels drawing 40 feet. There will be six duplicated locks.

It is obvious that its strategic advantages must principally lie with the power which controls its use in war time, and there is little doubt that the United States intends to be, and will probably succeed in being, this power.

Its great naval stations are situated at New Orleans, Key West, Guantanamo (Cuba), and Culebra (Porto Rico); these places practically dominate the Caribbean Sea and the eastern approaches to Panama.

The entry into world politics by the United States and the liabilities she is undertaking in Central America and the Caribbean Sea, as well as others in the Far East, must force her to increase her naval strength; it does not, therefore, appear an unreasonable assumption that the United States will be the supreme controller of this great waterway in war time. Under these conditions, therefore, what are the strategic advantages to be gained by both the United States and Great Britain respectively?

To the United States it gives a very much shorter sea route for her vessels of war when required to pass between the Atlantic and Pacific coasts, the distance saved over the Cape Horn route between New York and San Francisco being about 8,000 miles. It therefore doubles the potential force of the United States Navy by diminishing the time at present necessary for concentrating either to the east or to the west. This strategic advantage alone would appear to justify the construction of the Canal from the United States point of view.

It is not quite so clear that Great Britain can derive any strategic advantage from the Canal, as the distance from Plymouth, viâ the Cape of Good Hope, to Hong Kong is only 230 miles longer than the Panama route and has not the disadvantages of locks, restricted waters, and paucity of coaling-stations. Moreover, the distance from Plymouth to Sydney is actually 1,300 miles shorter by the Cape than the Panama route. The Suez Canal routes to both places are shorter still and better provided with British coaling-stations.

Should a concentration of British naval forces be necessary in the North East Pacific, the saving of time from England viâ Panama would be very considerable, but such a contingency is only probable in the event of the United States being our opponent, in which case the Panama Canal would probably be a closed door. Still we cannot lose sight of the fact that a great naval power has sprung up in Japan, and it is conceivable that the mutual interests of Great Britain and the United States may be threatened in the Pacific, which would entail mutual naval co-operation, in which case the Panama Canal might be used for strategical purposes by Great Britain.

From a commercial point of view, the balance of advantage generally will also be, probably for the same reasons (combined with the necessity of canal charges), in favour of the United States; sea traffic between the Atlantic and the Pacific ports of both North and South America will naturally increase and compete against the long and expensive traffic across the great continents; owing to the heavy cost of land transport over such great distances, the latter will have a difficult task to compete with the very much cheaper water transport, but such short railways as that now running across the province of Tehuantepec in Mexico and only about 200 miles long may succeed where the others fail.

Doubtless, so far as the export trade of Great Britain is concerned, the influence of the Canal will be principally due to the fact that it will bring many important purchasing markets, such as Australia and Japan, nearer to the eastern parts of the United States, in which are situated the manufacturing interests that compete with Great Britain in the markets concerned; but against this stands the present pre-eminence of British shipping.

There is every probability of the Canal having the effect of stimulating the ship-building industry of the United States. At present a very small percentage is carried in American ships, nearly one-half being carried in English ships alone. In this direction, therefore, we may expect English commercial interests to be affected.

Regarding the effect of the Canal on commerce from Europe to the Far East, it does not appear likely to attract much of it; owing to the great differences in distance compared with those by the Suez Canal route. The distance from Plymouth to Yokohama, for example, by the Panama route will be 12,645 miles, and by the Suez route only 10,920 miles. Moreover, the latter is well established and the only effect it could apparently have on the latter would perhaps be to reduce its canal dues.

There is no doubt, however, that eventually the Panama Canal must induce a greater increase in commercial activity through the Caribbean Sea, and that it will become a great thoroughfare. Every point of vantage therefore in this part of the world will increase in strategic importance, notably Jamaica (one of our fortified coaling-stations), which possesses a fine harbour and is almost directly on the Colon-Plymouth route, and is only 550 miles from Colon.

Amongst other future water schemes contemplated in the United States may be mentioned the project to complete a deep-water connection between Lake Michigan and the Gulf of Mexico. The former stands 578 feet above sea-level, and the route, starting at Chicago, will pass by the Illinois River to the Mississippi and New Orleans.

A small but important little waterway is also being constructed by the United States known as the Cape Cod Canal. The canal is only 12 miles long across the Cape Cod peninsula from Buzzard's Bay to Barnstaple Bay, but it will reduce the passage between New York and Boston by 65 miles. It is at present only designed for a depth of 25 feet at low water (minimum rise of tide 4 feet), with a width of 160 feet at the bottom, and will be a sea-level canal. United States naval stations are situated at Portsmouth, Boston, Newport, and New York, and though large warships will not be able to use the canal it will form an inside waterway connecting these places, and be utilised by torpedo-boat destroyers, etc. It is proposed to deepen the present canal from the Delaware River to Chesapeake Bay and to build another canal across New Jersey from the Delaware River to the Raritan River, a tributary of the Hudson River. This will permit the movement of small war-vessels along an inside coast route from north to south of the United States.

Associated with the Canadian and United States frontiers are the Erie and Welland Canals (Map XVIII.), the former connecting Lake Erie with the Hudson River—but being shallow (12 feet deep), with a large number of locks (72), it is not calculated to be of any strategic importance —and the latter connecting Lake Erie and Lake Ontario. It lies in Canadian territory (turning the Niagara Falls) and is 27 miles long, in which there is a drop of 333 feet, so that without this canal, water traffic between the Lakes would be impossible. Its depth is 14 feet and it possesses 25 locks.[1]

Between Lake Superior and Lake Huron runs the St. Mary River, very short but rapid, necessitating canals and locks for the passage of the Lake shipping. On the United States side of the river there are two connections, with two locks, each lock about 800 feet long, 100 feet wide, and 21 feet deep at the sills. On the Canadian side of the rapids is a lock 900 feet long, 60 feet wide, and 22 feet deep at the sills. The connecting canals are little over a mile in length. In 1909 a little more than two-thirds of the shipping passing between these lakes belonged to the United States.

A treaty between the United States and Canada was signed in January 1909, regarding the mutual use of the waterways along the frontier, but, in the event of war, is of no strategic importance.

The Georgian Bay Canal, however, is a project of first-rate importance to Canada, and all parties representative of the country are in accord that it should be put in hand as soon as ever the revenue of the country admits of it, and when the other great work—the Grand Trunk Pacific Railway—is nearer completion. Possibly 1912 or

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[1] This canal is the chief obstacle to the passage of large vessels between the Upper Lakes and the sea.

1913 will see the work commenced, and it is estimated it will take about ten years to complete.

The project is to connect Lake Huron (viâ Georgian Bay) with Montreal on the St. Lawrence. Its length will be 440 miles, depth 20 feet, with a large number of locks, as it will necessitate a rise over an area between 600 and 700 feet above sea-level. The route proposed will run from Georgian Bay along the French River to Lake Nipissing, and thence by the Ottawa River to Montreal.

It will, when completed, be commercially a great advantage to the country to have cheap water-transit facilities between the Lakes and Montreal, considerably shortening the distance viâ Detroit and Montreal. Strategically it will be an advantage to have the Lake steamers communicating east and west along a line farther removed from the southern frontier; but as long as the railways running still farther north are intact it is doubtful if the water transit would be much used, except perhaps for the heavier kinds of war matériel.

It is a far cry from Canada to the Malay Peninsula, but it is worth noting that there is a project for constructing a canal across the Isthmus of Krah (see Map XVII.), just near the Burmese frontier. The Isthmus here is only 27 miles wide, and nowhere more than 100 feet above the level of the sea. No executive action has yet been taken. When constructed it would shorten the sea route between Calcutta and China by 1,300 miles, and would strategically only effect an advantage by the more rapid transit of troops by sea from India, Burmah, to China, etc. It would practically be no saving in sea transit for shipping coming from the direction of Ceylon or South India.

CHAPTER VIII

PROJECTED RAILWAYS

EUROPE is now so well provided with railways that there are few projects for the future likely to influence strategical questions to any great extent; still, the balance of power is so easily disturbed that almost all new railways have to be carefully scrutinised from a military point of view.

It has already been referred to in Chapter III. that a line has been projected from the Bosnian frontier (at Uvatz) to Mitrovitza, the present terminus of the Salonica railway, running up the valley of the Vardar (see Maps VI. and VIII.). Austria would doubtless welcome such an improvement in communication towards the south.

TRANS-PYRENEAN RAILWAYS

(Map IV)

Three lines crossing the Pyrenees are now projected—one from Oloron (near Pau), to Zuera, another from St. Girons to Lerida, and another from Ax-les-Thermes to Ripoli; both these latter are nearly due south of Toulouse.

The railway from Perpignan to Villefranche and Bourg-Madame is already in existence, and it is proposed to extend it into the upper valley of the Tet; it will eventually link the line at Perpignan with the projected line from Ax to Ripoli. The construction of the latter is being actively prosecuted.

TRANS-ALPINE RAILWAYS

(Map VI)

A connection will be made (by a tunnel, etc.) between the Rhone Valley Railway (near Leuk, and Visp) and Thun, viâ the Kander River Valley. It is practically more than half finished, and should be completed in 1912. It is claimed that this will open up a route through Switzerland, viâ the Simplon Tunnel, from Boulogne or Calais, to Southern Italy, much quicker and shorter than any existing route.

It is proposed to construct a double line of railway with tunnels through the mountains, on the Swiss-Italian frontier, from Italy into the Canton of Grisons. It will run from Como to Coire, viâ the Splugen. This has not yet been sanctioned.

THE CAPE TO CAIRO RAILWAY

(Map IX)

This has already been referred to in Chapter IV. (page 107). Its completion is still only in the distant future, but, when accomplished, must greatly strengthen the influence of the power which operates it from both north and south. It runs now in Egypt as far south as Sennar on the Blue Nile, and will shortly be extended thence in a westerly direction till it meets the White Nile at Rabak.

Eventually, no doubt, it will be continued farther southwards up the valley of the White Nile.

The railway line from the Cape towards Cairo has already reached the Belgian frontier in the Province of Katanga, and its completion in the near future to the Lualaba River (i.e. the head-water of the Congo) is practically assured.

SOMALILAND TO THE NILE

(Map XVI)

The treaty rights referred to in Chapter IV. (page 97) give Great Britain power to construct a railway from Somaliland across Abyssinia to the Soudan. Hitherto no project has, it is understood, been formulated on these lines, but a well-marked route seems indicated from Berbera to Harrar, Adis Ababa, thence to the west, and striking the White Nile about 300 miles south of Khartoum.

CONGO RAILWAY

(Map IX)

It is proposed, by constructing railways above the Upper Congo where it is not navigable, to open up a complete service from Boma (at the mouth) to Katanga.

With this object about 750 more miles of railway are projected to continue the line already in existence from Stanleyville to Ponthierville.

NORTHERN NIGERIA

(Map IX)

A railway is projected from a point about 60 miles south of Zaria (on the Baro-Kano line) to the Bauchi province, with a view to opening up the tin-fields there. It will shortly be begun, and will be 120 miles in length.

ASIATIC TURKEY

(Map XV)

The Anatolian or Baghdad railway has already been referred to in Chapter V. (page 132). It is actually constructed up to Bulgurlu, at the foot of the Taurus Mountains, and is now being constructed over the Taurus in fitful and spasmodic efforts. Its probable route will be by Adana, Killis, Tel Habesh, Birijik, Mosul, Baghdad, and Busra.

The Damascus-Hedjaz railway will be extended northwards from Aleppo to join the Baghdad line about Tel Habesh.

A railway (American) has been projected from Alexandretta to Van, viâ Diarbekir, but has not yet been formulated or sanctioned by the Turkish Government.

PERSIAN AND INDIAN RAILWAY PROJECTS

(Map XIV)

Hitherto no railways have been laid down in Persia, but it is only a question of time, and that shortly, when they must be constructed.

There are many projects in the air for an overland railway route from India, and as such a line would be of importance strategically it will be of interest to consider briefly the possible routes it might follow. (See Map XIV.)

Between the Russian terminus of the Merv railway at Kushk and the Indian railway terminus at New Chaman is only about 500 miles, and there are no great difficulties between from an engineering point of view. At first sight this would appear simple to bridge over. From a strategical point of view some authorities are against pushing a railway of any kind in front of our line of defence at Kandahar; commercially it is doubtful if this connection would ever pay, if it is considered that the connection on the Russian side entails a long detour by Tashkend and Orenburg before Europe can be reached, unless the Caspian Sea is crossed at Krasnovodsk.

A straight line from Karachi to Europe passes through Baluchistan and Persia. Assuming, therefore, that the north of Persia (say Ispahan and Teheran), is linked up with Europe (either by the Baghdad railway, or, what is still more probable, the Russian railway from Erivan and Julfa extended southwards), what routes are possible to connect Northern Persia with India?

Assuming that the strategic argument of safety renders it inadvisable to extend the line of railway from either New Chaman or Nushki, and bearing in mind the antagonism of the Afghans to railways in their country, it is evident that a route through Makran from Karachi would answer all requirements. Sir T. Holdich points out in his "Gates of India" (page 322) how this route is possible, starting from Karachi and going by Las Bela, Panjgur, and thence over the divide (4,000–5,000 feet) by Dizak, Regan, and Bam, or following the line of the telegraph along the Persian border to Koh-i-Malik Siah, and thence over the mountains skirting the desert Seistan to Bam. From Bampur to Kerman and Yezd the road runs in the valleys between the mountains, offering no engineering difficulties, and from Yezd to Ispahan another divide has to be crossed, but the difficulties are not great.

Ispahan is 5,300 feet above the sea-level, and from Makran to Ispahan this route falls nowhere between 3,000 feet.

Sir T. Holdich says: "A direct route through a line from Panjgur to Karachi by the old Arab caravan route within striking distance of the sea would apparently outflank not only all political objections, but would satisfy those military objectors who can only see in a railway the opportunity for invasion of India."

THE SIBERIAN RAILWAY

(Maps III, XI, and XIII)

The existing line through Tomsk and Chita to Khabarovka and Vladivostock has been referred to already in Chapter VI. (page 141).

From Omsk eastwards to Chita it will be double-tracked by 1912.

From Omsk westwards there are now two separate and parallel lines to Moscow and St. Petersburg viâ Cheliabinsk—Samara and Tiumen—Perm respectively, as the section Tiumen—Omsk is practically completed.

One of the most important railway projects in Siberia is that for a line to run from Uralsk to Orenburg, Orsk, Akmolinsk, Semipalatinsk, Barnaul, and Ob; the latter is on the main line just south-west of Tomsk. This project, it is understood, is well in hand, though no actual construction work has yet been begun. When completed it will greatly increase the facilities for movements of troops and material on the section west of Tomsk. There will then be three parallel railway lines from Russia in Europe towards the east converging on Omsk and Tomsk.

A second project, which, though much smaller, is perhaps of more immediate interest to the Indian Empire is the construction of a line from

Samarkand to Termez (on the Oxus) viâ Karshi, and another line from Charjui to Termez viâ the Oxus Valley (see Map XIV.); the routes for these railways have been surveyed, but it is understood that construction work has not yet been actually begun. As they would each be only about 250 miles in length and there are no great engineering difficulties en route, it would not take long to complete them. When completed they would emphasise the strategic importance of the Askabad-Tashkend line, as they would greatly facilitate military concentration by Russia in the neighbourhood of Balkh on the frontier of Afghanistan and opposite the Kabul passes of the Hindu Kush.

A railway is projected from Andijan (Tashkend railway) viâ Vierny to Semipalatinsk, but it is understood it is not even completely surveyed and no executive action is yet taken on it. It would facilitate military communications between the Russo-Afghan frontier and Northern or Eastern Siberia.

Another railway project still very much in the air is the construction of a line from Nigsovaya (south end of Lake Baikal) to Pekin viâ Urga and Kalgan. The section from Pekin to Kalgan and Sui-Yuan-Ting (on the Chinese frontier) is already practically constructed, but the prospect of any further extension for some little time is doubtful. Its construction would place Russia in more direct contact with China and bridge over the desert of

Gobi. At present Russia's closest and most direct touch with China Proper is principally through Manchuria, and this is necessarily modified and influenced by Japan. It seems reasonable, therefore, to assume that Russia would favour the projected Urga-Pekin railway.

CHINESE RAILWAYS

(Maps III, XI, and XVII)

The importance has already been pointed out in Chapter VI. (page 156) that must be attached to the developments of railways in China.

Before it can become a military power of any great magnitude outside its own country, its railways must be developed, and strategists must watch its progress in this direction closely.

The following is a list of some of the more important projections:

Tsientsin to Pukou (on the Yangtze)	500 miles	(British and German).
Canton to Hankau	720 ,,	(Chinese).
Hankau to Chingtu	800 ,,	,,
Chin-chou to Tsitsihar and Aigun	900 ,,	(American).
Yunnan to Lu Chou	350 ,,	(French).
Sui-Yuan-Ting to Urga	550 ,,	
Canton to Amoy and Fuchau	500 ,,	
Canton to Wuchow	150 ,,	
Longsan (in Tongking) to Nanning	150 ,,	
Kai-fong-fu to Yenchou	150 ,,	
Hangchou to Ningpo	100 ,,	

The first of these is only second in importance to the Pekin-Hankau line, as, when completed, it will secure communication between Pekin and Shanghai, with probably a train ferry across the Yangtze between Pukou and Nanking.

The Canton-Hankau railway will complete the connection (over 1,200 miles) between North and South China.

The Chin-chou–Tsitsihar railway will run practically parallel to the Mukden-Harbin line and about 100 miles to the west of it. Tsitsihar is on the Manchurian section of the Chita-Vladivostock railway, and Aigun is on the right bank of the River Amur.

A line is projected from Hankau to Chingtu in the Province of Szechuan right into the west of China Proper. For two-thirds of the distance it will follow the line of the Yangtze River and then strike across country due west. The preliminary surveys have been completed.

This Chingtu project is of special interest to British India, as it would facilitate Chinese communications with Thibet and its capital, Lhasa. The country immediately to the west of Chingtu is a high, treeless plateau averaging about 12,000 to 14,000 feet in height, and surrounded by high ranges ascending to 17,000 feet and even 20,000 feet above sea-level. The principal towns here are (from east to west) Tatsien, Litang, Batang, and Siangchen.

From 1903 to 1906 this part of the borderland was practically in the hands of the Thibetans, after which Chinese authority asserted itself, and the power of Lamaism over the whole region was broken, and the telegraph was extended to Batang.

AUSTRALIA

(Map I)

The pressing necessity for railway communications in Australia, both for commercial and strategical purposes, is now becoming fully recognised, and it is probable that these needs will be met in the near future.

Rival claims between the advocates for making Port Darwin in the north, or Fremantle in the west, the principal port for the embarkation of European mails still divide public opinion, but the latter appears inclined to favour the western port.

There are accordingly two great railway projects, one to extend northwards from Oodnadatta the existing (3 feet 6 inches gauge) line Port Augusta—Oodnadatta, in South Australia, to Pine Creek, near Port Darwin; and the other is the construction of a line from Port Augusta to Kalgarli, which latter is already connected by rail with Perth. Both these projects would entail the same amount of mileage to be constructed, that is 1,063 miles.

From a strategic point of view this latter project would be of great value, completing the lateral inland communication along the southern coast-line from Perth to Adelaide, Melbourne, and Sydney.

Unfortunately, at the present date, railways in Australia have three different gauges; they are as follows:

New South Wales . . .	3 ft. 6 in. and 4 ft. 8½ in.
Victoria and South Australia .	5 ft. 3 in.
Queensland and West Australia .	3 ft. 6 in.

From a strategic point of view it is to be hoped that a uniform gauge will eventually be adopted.

No doubt in time both the above projects will be completed; and if, as is probable, the 4 feet 8½ inches gauge is adopted uniformly, the railways will be well adapted for defence from Perth to Brisbane by the south, and the rapid transfer of troops and stores assured to and from the northern territories.

UNITED STATES OF AMERICA

Florida Keys Railway.—This enterprising project is a continuation of the Florida East Coast Railway, so as to connect Key West (the United States naval base) with direct railway communication to the north. The engineering difficulties have been very considerable, as the idea was to connect the chain of islets by railway, commencing at Miami on the mainland, and ending at Key West, covering a distance of 156 miles. Between these two points the line includes forty-one islands, with several miles of concrete viaducts over the intervening channels, and 80 miles of embankments across the islands.

This railway is well in hand, and can hardly be called a project, as it is actually under construction, and trains are running to a point 84 miles south of Miami.

When completed it will strengthen Key West as a naval base, and shorten the sea journey between the States and Cuba to 90 miles.

CANADA

(Map XVIII)

The only large important project necessary to notice at present in Canada is that connected with the opening up of a new route to Western Canada by Hudson Bay.

The remarkable growth of Western Canada during the last decade has found that the communications with it from the East are not equal to its requirements.

In spite of the construction of the Canadian Northern and the Grand Trunk Pacific Railways, and the double-tracking of the Canadian Pacific Railway between Winnipeg and its Lake ports (Fort William and Port Arthur), the congestion continues.

It is stated that not more than 20 per cent. of the wheat crop can get shipped away from

Port Arthur before Lake Superior begins to freeze up.

The West has therefore insisted on the construction of the Hudson Bay Railway, and the Government has now definitely promised it.

This railway will probably be extended from the Pas on the Canadian Northern Railway to either Fort Churchill (474 miles) or Port Nelson (410 miles) on Hudson Bay. The former is a fine natural harbour, but with a very limited existing area of deep water. The navigable approach to Port Nelson is encumbered by shoals, but could be converted into a spacious harbour, though unprotected except by shoals, from all easterly and north-easterly gales.

It has not yet been decided which port will eventually be adopted, but, assuming it is Fort Churchill, the following geographical facts are of the highest importance:

First, that Saskatchewan is in reality no farther from England than Eastern Canada, for the distance from Liverpool to Fort Churchill is only 2,946 nautical miles, or 19 miles more than the distance from Liverpool to Montreal by Cape Race.

Second, to reach Edmonton, Vancouver, or Prince Rupert from Montreal it will be necessary to pass over about 800 miles more rail than if travelling from Fort Churchill.

These facts speak for themselves, both from a commercial and strategical point of view; but it must be remembered that at present this route would not be available, on account of ice in Hudson Bay, except during the months of July, August, and September; but the ice formed in Hudson Bay is not very formidable, being confined chiefly to the shoals and shores: the advocates of the route are hopeful that with special ice-breaking vessels the route can be kept open nearly all the year round. There is really less fog to contend with along this route than on the St. Lawrence route, and with wireless telegraph stations on Hudson Bay Straits notice can be given to shipping of icebergs, etc. The route will be a valuable strengthening of the "all-red route."

TRANS-ANDINE RAILWAY

The connection by rail across the Andes in the neighbourhood of the La Cumbre Pass (12,605 feet) is a remarkable achievement. It completes connection between Valparaiso (Chili), Mendoza, and Buenos Aires (Argentine railways). This railway will shorten the distance between Western Europe and Australia by 1,000 miles. After thirty-seven years of construction it was opened to traffic this year (1910).

CHAPTER IX

NAVAL DOCKYARDS, DEFENDED PORTS, AND COALING-STATIONS

IN considering the strategic value of naval dockyards, ports, and coaling-stations, it is necessary not only to appreciate their geographical positions, but also general usefulness and capabilities for providing means of repair or refuge in time of war.

They vary greatly in the number and size of docks, harbour area, strength of defences, and strategic importance on lines of communication.

Those provided with dock accommodation naturally are of first importance, and are therefore more highly defended, whereas specially selected ports, such as would be utilised for coaling-stations, are only defended against "raiding forces."

In the United Kingdom the dockyard ports are situated as follows: Portsmouth, Plymouth, Chatham, Sheerness, Pembroke, Cork, and Rosyth (in 1918).

There are important defended naval ports at Berehaven, Lough Foyle, and Dover.

The two former possess magnificent natural harbours, with ample accommodation for the largest battleships, and from their geographical positions are important naval bases for operations on the Atlantic.

Dover is only provided with very limited accommodation for battleships, but is available for refuge of the latter against torpedo attacks in the narrow waters of the Straits. It also forms an excellent base for torpedo boats.

Abroad, the British naval dockyards are situated at the following places: Gibraltar, Malta, Hong Kong, Sydney, Bombay, Simon's Town, Bermuda, and Halifax. The latter (with Esquimault) is now directly under the Canadian Government, but there is every reason to think it will be maintained at its present level. Calcutta, although not owning a naval dockyard, possesses Government dockyards both wet and dry.

GIBRALTAR

(Map II)

Gibraltar is the home of the British Atlantic Fleet, and its position at the entrance to the Mediterranean makes it a naval base and dockyard of the first importance.

It stands on a rocky promontory 3 miles in length, $\frac{3}{4}$ mile in breadth, and 1,439 feet at its greatest elevation, near the southern extremity of Spain, with which it is connected by a low narrow isthmus. The opposite coast of Africa is 14 miles distant.

It is fully equipped with graving-docks and enclosed harbour (capable of taking the largest battleships), situated on the west side of the Rock, which situation does not entirely free it from the danger of bombardment from possibly concealed points on the mainland between 8,000 and 9,000 yards distant. This danger, however, could only arise if Spain were at war with Great Britain.

MALTA

(Map II)

Malta is the base of the Mediterranean Fleet and is considered one of the strongest maritime fortresses in the world. It is stronger than Gibraltar or Hong Kong in having no land frontier to protect, and capable, for this reason, of greater powers of self-defence than any other British stronghold. It is fully supplied with graving-docks, and its strategical value is quite as great as Gibraltar. It is placed midway on the direct route, 2,000 miles long, between the Suez Canal and Gibraltar. Nearly equally distant from Messina (180 miles) and Cape Bon (220 miles), Malta divides the Mediterranean Sea into two halves, and commands the approaches into the eastern half either through the narrow Straits of Messina or through the 80-mile channels between Cape Bon and the coast of Sicily.

It must be understood that it is not the guns of fortresses like Gibraltar and Malta that command the adjoining waters, but the facilities they give for close naval action based on these places.

HONG KONG

(Map XVII)

Hong Kong is a naval base and the headquarters of the British China Squadron. It is an island stretching nearly east and west, about 11 miles long and 2 to 5 miles broad, and the Crown Colony now includes part of the mainland (Kowloon), making a total area of about 400 square miles. The island lies close to the mainland and possesses one of the largest harbours in the world (about 10 square miles). Its east and west entrances are both narrow, and its defences make it safe against any attack by sea. The land front to be defended extends for about 11 miles. It is fully provided with dockyards and naval requirements.

The island is broken in shape and mountainous, the highest point being Victoria Peak, which is 2,000 feet high.

Hong Kong has now become the largest commercial port in the world; its position at the mouth of the Canton River, and its relations with China generally, will probably make it of still greater importance in future developments in the Far East.

SYDNEY

(Map I)

Sydney, one of the finest harbours in the world, is a first-class naval station and the headquarters of the British fleet in Australian waters.

Its geographical situation in the Pacific, on the east coast of Australia, with its natural harbour advantages and proximity to the extensive coalfields of New South Wales, must always make it a place of first-class importance to Great Britain, and its value to Australia will be enhanced when the Commonwealth capital is established on the new site selected for it in the Yass-Canberra district, only about 150 miles from Sydney.

BOMBAY

(Map I)

Bombay is the largest and safest harbour in India, and from its position with reference to the continent of India, and to both the Suez Canal route and the sea route between India and South Africa, attains a strategic importance second to none. It was from Bombay the Indian forces were despatched so rapidly and in time to save Natal in 1899. Reinforcements of land forces either to or from India must almost of necessity make use (partly, at any rate) of Bombay. For commerce it occupies one of the most advantageous positions in Asia. It possesses first-rate dock accommodation, is strongly defended, and from it railways diverge in every direction to all parts of India.

CALCUTTA

(Map I)

Calcutta is the capital of India, and is well supplied with dock accommodation and railway communications, but its sea approaches up the River Hooghly entail very careful pilotage; this, on the other hand, makes it less vulnerable from the sea.

SIMON'S TOWN (CAPE TOWN)

(Map I)

Simon's Town, lying at the southern extremity of the African continent, attains its chief strategic importance as a naval base on the open-sea routes to British possessions in the East, and since the increase of British interests in South Africa its importance has necessarily increased.

The naval base is situated in Simon's Bay (inside False Bay). It is fully equipped and strongly defended.

HALIFAX

(Map I)

Halifax is the capital of Nova Scotia and one of the terminals of the Grand Trunk Pacific Railway (intercolonial), and has a magnificent harbour, covering 10 square miles, which is one of the principal winter ports of Canada (being ice-free) and the entrepôt of a large trade with the West Indies and South America. Its dock accommodation is large and good. To safeguard the interests of Canada on the east it would appear essential to maintain it as a naval station, and no doubt the Dominion Government will do so. From an Imperial point of view some authorities assert that the naval base at Bermuda is sufficient without an additional base at Halifax.

BERMUDA

(Map I)

Bermuda consists of a cluster of small low-lying islands 250 miles off the North Carolina coast of the United States.

It is a first-class naval base, with dockyards and naval equipment. Its harbour accommodation is large, though the sea entrances through the reefs are narrow but deep. Somewhat similar to Malta in having no land frontier, it lends itself easily to defence.

BRITISH DEFENDED COALING-STATIONS

In addition to the British naval dockyards abroad, which are all strongly defended, certain stations have been selected for defence as coaling-depôts, etc.

The British defended coaling-stations are as follows: Jamaica, Sierra Leone, St. Helena, Durban, Cape Town, Mauritius (Port St. Louis), Aden, Colombo, Karachi, Rangoon, Madras, Calcutta, Singapore, Thursday Island, Fremantle, Adelaide, Melbourne, Brisbane, Hobart (Tasmania), Auckland, Wellington, Lyttleton, and Esquimault.

In addition to these, there are many coaling-stations undefended all over the world, but their utility in time of war could not be relied on; amongst them, however, it is worth noting the attributes of Labuan, an island in the Malayan Archipelago situated about 6 miles off the north-west coast of Borneo (see Map III.).

It forms part of the settlement of Singapore, and possesses a fine harbour, extensive coal-mines, and is within easy reach of the Borneo oil-fields. Its position in the South Chinese Sea ought to make it of strategic value to Great Britain. It is one of the cable-stations of the Eastern Extension Telegraph Co. and in direct communication with Singapore and Hong Kong.

JAMAICA

This station possesses a fine harbour, easy of approach and easy to defend.

It is situated in an important position with reference to the Caribbean Sea and possible future developments in it which have already been referred to in discussing the strategical and commercial future of the Panama Canal (see page 175, Chapter VII.).

SIERRA LEONE

Sierra Leone is a British colony on the West African coast (see Map IX.). Sierra Leone Proper is a peninsula containing about 300 square miles, but with the Protectorate in the Hinterland about 33,000 square miles, or about the same size as Ireland.

It is bounded on the north by the Grand Scarcies River, and on the south by Liberia. On the east the frontier was settled by an agreement with France in January 1895, by which the colony relinquished all control of the head waters of the Niger and became enclosed on every side.

The capital is Freetown (population 34,000), from which place a railway runs to Baima, a distance of 220 miles.

Its chief attribute, however, is its splendid harbour, and though its strategic value in the landward direction is little, its situation on the West coast gives it a special value on the trade routes which pass by the Cape of Good Hope and Cape Horn. It also forms a naval *point d'appui* for operations along these routes and towards the West Indies or South America, the nearest point of which latter is only about 1,500 miles distant.

It is practically half-way between Plymouth and Cape Town, and forms a naval connecting-link between Gibraltar and Simon's Bay. It is worth noting that the French have established a naval base at Goree in French Senegal, and the Germans at the Cameroons.

SINGAPORE

Singapore is the gateway into the Pacific, and it is also the strategical pivot round which radiate the three divisions of the Eastern Fleet—the East Indian, the China, and the Australian Stations—which are based on Bombay, Hong Kong, and Sydney respectively. In time of war, Singapore will be the central rendezvous of these three fleets for coaling, victualling, and refitting, as well as for offensive operations.

Singapore is an island off the southern extremity of the Malay Peninsula. It is hilly, forested, fertile, and not unhealthy to Europeans. The city of Singapore is a great commercial centre for the East.

It has a large and commodious natural harbour, which it is proposed to improve for smaller craft by the construction of nine breakwaters. The docks (Tanjong Pagar) are now the property of the Government.

The place is strongly defended, and has the advantage over some other naval stations that its adjacent territory contains a friendly population, able and willing to contribute supplies, etc.

The harbour in the extent of its shipping is one of the greatest ports in the world, being a port of call for vessels trading between Europe or India and the Far East, the north of Australia, and the Netherlands Indies. It is strongly defended, and the sea passage for ships at this point of the Malacca Straits is only about 30 miles wide. The Island of Labuan (already mentioned) and the Cocos or Keeling Islands are, with Singapore, under the Straits Settlement Government, the Keeling Islands being of importance on account of the cable-station there. (See Maps I. and III.)

ADEN

Aden stands at the entrance to the Red Sea and about half-way between Bombay (1,650 miles) and Port Said (1,475 miles). (See Map III.)

It is an extinct volcano, 5 miles long by 3 miles wide, jutting out into the sea (much as Gibraltar does), and connected with the mainland by a narrow isthmus of flat ground three-quarters of a mile wide. Barren and black, dreary and waterless, it is destitute of every natural gift, except the possession of a fine harbour in an important strategic position dominating the Suez Canal route at the point where the routes to India and the Far East and the South divide. It is purely a defended coaling-station, but is naturally capable of a strong defence.

The harbour is a great entrepôt for trade between East and West, and has the islands of Perim, Socotra and Kuria-Muria as its dependencies. It is principally dependent for its supplies on the opposite Somaliland coast-ports.

In addition to Aden itself, Great Britain exercises a general protective influence over the whole of the southern coast of Arabia as far as Oman; it also holds preferential interests in Oman, supported by treaties; the Arab chiefs of the pirate coast in the Persian Gulf are under British protection; and it has special relations with the Sheikh of Koweit, who is a prominent figure in Arabian politics. Practically one-half of the coast of Arabia is under direct British influence.

The Hinterland of Aden (see Map XIII.) is at present in a condition of constant strife. The tribes war with each other and with the Turks; tribes under our protection fight with tribes under nominal Turkish protection; and the Turkish forces engage in intermittent warfare with the followers of the Imam of Sana. The Turks have really never conquered Yemen, and their administration of the portion of the province which they spasmodically control has in the past been defective. On the southern coast of Arabia the Sultan of Makalla, who is under British protection, has recently started a little campaign of conquest on his own account in the interior of that mysterious and little known land, the Hadramaut.

Central Arabia also is at present once more plunged into deadly strife. The two great ruling families, the Ibn Sands and the Ibn Rashids, are again in conflict. Though the very existence of these warriors is hardly known to the British public, yet they have their connection with British politics. It is always possible that one or other of the parties may be strong enough to invade territory where British interests prevail, and these possible incursions cannot be left out of sight in considering our strategic position on our nearest route to India.

ESQUIMAULT

Esquimault, besides guarding the terminus of the Canadian Pacific Railway, is the only British naval station available in the North Pacific. Its original *raison d'être* was on account of the naval pretensions of Russia in the Pacific. For the moment, its primary purpose has vanished, but there are now other powers to consider besides Russia, and, should naval operations be contemplated by Great Britain in this part of the world in the future, at least one naval repairing-station would appear to be an essential. We must also remember that despatch of land forces by the "all-red route" may sometime become a matter of practical politics, and this could only be accomplished by first asserting the command of the sea (as against the power that for the time being is our enemy) in this part of the Pacific.

Esquimault is situated 2 miles west of Port Victoria at the south end of Vancouver Island on the Juan de Fuca Straits, through which all the sea traffic to Vancouver (on the mainland) passes.

Its dock accommodation is at present negligible, but its harbour area is good and can easily be defended; it can draw readily on the extensive coal supplies of British Columbia.

Esquimault and Halifax, as naval stations, are now entirely dependent on the Dominion Government for their maintenance and defence.

CHAPTER X

ROUTES TO THE COLONIES. THEIR PROTECTION. FOOD SUPPLIES. CABLES AND WIRELESS TELEGRAPHY. AERONAUTICS. NAVAL FUEL.

IT is important to consider the position and nature of British, French, and German routes to their colonies in order to be prepared for their use or denial on the outbreak of war. In order to give a rough idea of the relative distances and times along these routes (see Maps I. and III.), an approximate estimate will be given of them, but it should be remembered that the times of transit must vary very much with the class of ship or railway utilised, and these estimates of time must be altered accordingly. In most cases a steaming-rate of 400 miles a day has been taken.

Routes from England (Plymouth)

	Approximate distance.	Approximate time in transit.
To India:		
Viâ Suez Canal . . .	6,000 miles	15 days
„ Cape of Good Hope .	10,500 „	26 „

ROUTES FROM ENGLAND (PLYMOUTH)—*continued*

	Approximate distance.	Approximate time in transit.
To Australia (Sydney):		
Viâ Quebec and Vancouver .	13,000 miles	26 days
,, Suez Canal	11,200 ,,	28 ,,
,, Cape of Good Hope .	12,300 ,,	31 ,,
,, Panama	12,500 ,,	32 ,,
,, Magellan Straits . .	12,900 ,,	33 ,,
To Hong Kong:		
Viâ Suez Canal . . .	9,500 ,,	24 ,,
,, Cape	12,800 ,,	32 ,,
,, Vancouver . . .	12,000 ,,	30 ,,
,, Siberian Railway (viâ Port Arthur and Berlin)	8,700 ,,	16 ,,
To Canada:		
Montreal	3,000 ,,	6 ,,
Vancouver viâ Montreal .	5,800 ,,	10 ,,
,, ,, Halifax . .	6,000 ,,	9 ,,
To South Africa (Cape Town):		
Viâ Madeira	6,000 ,,	15 ,,
,, Suez Canal . . .	8,400 ,,	21 ,,
To Sierra Leone	2,800 ,,	7 ,,
To Jamaica	4,000 ,,	10 ,,

The following approximate distances will be found useful:

Cape Town to Bombay	4,700 miles.
Cape Town to Fremantle . . .	4,800 ,,
Sydney to Auckland	1,300 ,,
Bombay to Suez	3,000 ,,
Bombay to Durban	3,800 ,,
Madras to Singapore	1,600 ,,
Singapore to Hong Kong . . .	1,400 ,,
Hong Kong to Yokohama . . .	1,600 ,,
Yokohama to Vancouver . . .	4,400 ,,
Vancouver to Sydney	7,000 ,,
Vancouver to Hong Kong . . .	6,000 ,,
Panama to Sydney	8,000 ,,
Panama to Wellington	6,500 ,,
Vladivostock to St. Petersburg . .	5,600 ,,

The route to India viâ the Suez Canal has to traverse the Mediterranean, where the French, Spanish, Italian, Austrian, and Turkish powers possess naval centres of activity, and the free use of this route in war time must depend on which of these powers are friendly or otherwise.

Many authorities argue with some force that although the use of the Suez Canal in war time has been internationally guaranteed, its use could be made inoperative to England by any Great Power at war with that country, and it is probable the risks would necessitate the Cape route being adopted under most circumstances for the despatch of troops and material. It is not necessary for an enemy actually to block the Canal to render it useless, if he can prevent the approaches to it from being considered safe. Much depends, therefore, on the power at war with Great Britain at the time.

The French possess torpedo-boat centres of activity at Toulon, Port Vendres, Oran, Algiers, and Bizerta, the latter being a large naval station.

In the event, however, of a war with any Oriental power, it is probable that the Suez route would be of great strategical importance. In any case it is the principal and shortest route by sea not only to India, but to Australia and Hong Kong, and is well defended by Gibraltar, Malta, and Aden.

The distances and times of transit given in the list to India are sea transits only, but the passenger routes across the European continent would considerably lessen the figures.

As regards reinforcements for Egypt it is well to recognise the fact that although the Mediterranean route might be strategically depreciated, circumstances might justify reinforcements being sent from India (if they could be spared) along the comparatively safer route viâ Aden.

The Cape route to India must become a most important one in war time, as even if the Suez Canal was considered available, the safer route (viâ the Cape) would be adopted where time was not so essential. It lies in open waters all the way, with British defended ports at Gibraltar, Sierra Leone, St. Helena, Simon's Bay, and Mauritius distributed along it.

The French naval station at Goree and the German station at the Cameroons lie, however, in proximity to its flank.

The Australian Suez Canal route diverges from the Indian route at Aden, after which the open waters are favourable to its use by all classes of traffic.

It will be seen, however, that the loss of the Suez Canal route would not be strategically of such importance to Australia as it would be to

India, for the Cape route is but little longer even to Sydney, and if Fremantle be taken instead of Sydney, the distance from Plymouth to Fremantle viâ the Cape is reduced to 11,000 miles, which is actually less than the Suez Canal route to Sydney.

It is doubtful if the Panama Canal or Magellan Straits route would ever be of any strategical use, considering the advantages of the Cape route; the former would pass through foreign territory, and the latter is longer and passes through colder and stormier regions in the neighbourhood of Cape Horn.

The Canadian route to Australia and the Far East is what is sometimes called the "all-red route," and will pass viâ Halifax (or Quebec), and Vancouver to Australia and New Zealand, and be available for the transport of troops (passing through British territory only), and accomplishing the journey in 22 to 26 days. This would be about a week shorter than the Cape route. The line of steamers capable of maintaining this service has not yet been started, but, it is expected, will be running in the near future.

To Hong Kong the Suez Canal route would still be shorter than any other, and in distance there is little to choose between the Cape route and the Canadian route; owing, however, to about one-quarter of the Canadian route being by railway, it would be quicker, if the necessary steamers were available at Vancouver. At present the existing Canadian steamship line runs to Yokohama, and the Peninsula & Oriental Company's steamers run from Yokohama to Hong Kong. The Siberian route to Hong Kong is very much the shortest, but it involves crossing foreign territory, and it is unlikely that it would, therefore, be of any strategic value to Great Britain.

The routes to Canada, the West Indies, and South Africa (viâ Madeira) are all open routes.

FOOD SUPPLIES

The United Kingdom is so entirely dependent for its food supplies on outside sources, that strategic considerations of offence or defence must take the problem of the maintenance of food supplies in war time into account.

It will be sufficient here to note a few main facts as to the minimum stock of wheat in the United Kingdom, the sources of supply, and the routes they pass over.

It may be taken as fairly near the mark that not more than two months' supply can be counted upon at any time as being stocked in the United Kingdom.

Our wheat supplies at present come principally from the following countries, and are represented by the following approximate percentages:

Canada	16	per cent.
United States	15	,,
Argentine	20	,,
India	15	,,
Australia	10	,,
Russia	18	,,
Other sources	6	,,
Total	100	

It will be observed, therefore, that the North Atlantic carries 33 per cent., and that another 21 per cent. passes the Cape de Verde Islands from the Argentine.

The Australian trade would probably, in the event of war, use the Cape route, and join the Argentine route at the Cape de Verde Islands.

The Russian supply is dependent on the Mediterranean route.

In connection with this it is interesting to note that, in the 1904 war, Russia and Japan (both Great Powers) elected to inaugurate, so far as merchant vessels were concerned, a policy of annihilation in war—that is to say, they made no attempt to take captured merchant ships to any port where they could be dealt with by a Prize Court, but sunk them at sight. Our merchant trade is not only larger than that of any other power, but of more importance to us, on account of our food requirements; it is evident, therefore, we must expect it to be very seriously attacked in the event of war. In the latter event it would appear that an organisation for keeping some of these food-supply routes open is imperative, and that such organisation of the naval forces detailed for this duty must be made apart from that organised for seeking out and defeating the concentrated naval forces of the enemy, as both organisations will have to act simultaneously, and, probably, along divergent lines.

CABLES AND WIRELESS TELEGRAPHY

The advent of wireless telegraphy has somewhat discounted the strategic value of cables in war time, particularly for Great Britain, which latter power commands the use of the principal cable-lines of the world (see Map I.). The principal deep-sea cable-stations are at Land's End, in Cornwall, and Valentia, in Ireland. There is also another at Waterville (south of Ireland), from which one British cable runs to Halifax, and four American cables to Canso, in Nova Scotia. Two more American cables run from Land's End to the same place.

The principal British cables run as follows :

Waterville—Halifax—Bermuda and West Indies .	1 cable.
Valentia—Newfoundland—Canada and United States	5 cables.
Land's End—Azores—Cape de Verde Islands—Ascension—St. Helena and Cape Town . . .	1 cable.
Land's End—Gibraltar—Malta—Alexandria . .	1 „
Land's End—Lisbon—Malta—Alexandria . . .	2 cables.
Land's End—Madeira	1 cable.
Madeira—Cape de Verde Islands	3 cables.

Cape de Verde Islands—Pernambuco	2 cables.
Suez—Aden—Bombay	3 ,,
Aden—Zanzibar—Mozambique—Durban	1 cable.
Zanzibar—Seychelles—Mauritius	1 ,,
Durban—Mauritius—Keeling Islands and Perth	1 ,,
Keeling Islands—Batavia and Singapore	1 ,,
Madras—Penang—Singapore—Labuan—Hong Kong	1 ,,
Singapore—Banjuwangi (Java)	1 ,,
Banjuwangi (Java)—Port Darwin	2 cables.
Banjuwangi (Java)—Roebuck Bay (West Australia)	1 cable.
Sydney—Port Nelson	2 cables.
Brisbane—Norfolk Island—Fiji—Fanning Island—Vancouver	1 cable.

The land lines across Canada, Egypt, India, and Australia, complete these cable communications through British possessions.

The land telegraph is now complete from Upper Egypt to Entebbe (Uganda) and Mombasa, and will shortly be connected at Ujiji with the land line to Blantyre and Cape Town.

A British land line connects Karachi and Bushire with Ispahan, Sebastopol, and the European systems. There is also a cable from Karachi to Bushire.

India can therefore receive or send messages from or to England over British possessions by only one route, namely:

Bombay—Suez—Gibraltar—Land's End.

But if the Portuguese and Dutch are counted friendly, then the following three routes may be added:

Bombay—Aden—Durban—Cape Town—Cape de Verde, etc.
Madras—Singapore—Java—Keeling Islands—Cape, etc.
Madras—Singapore—Australia—Canada, etc.

A new Atlantic cable route is now projected to connect Great Britain and Canada, with every prospect of its adoption in the near future. It will run from the North of Scotland viâ the Faroe Islands, Iceland, Greenland (Cape Farewell), to Labrador (Hamilton Inlet). In adopting this route the shortness of each continuous length (the longest is 670 miles) possesses great technical advantages, which will increase its comparative capacity over the existing Atlantic cables, thus more especially facilitating and improving electrical communication for through traffic to Australasia. The latter and Montreal have already been placed in direct electrical communication with each other viâ Vancouver and Fanning Island.

Wireless-telegraph stations are being rapidly installed all over the world. Germany can now communicate directly with the Cameroons from Berlin, and the French with their African possessions. Great Britain has Government stations at Gibraltar, Malta, Aden, and Bombay, and Lloyds has a station at Port Said, so that communication in this way with India is assured.

AERONAUTICS

The advent of the dirigible and the aeroplane has placed beyond doubt the fact that a new and practical method of ascertaining and transmitting military information has been added to those already existing, such as telegraphy, visual signalling, pigeons, motor-cars, cavalry scouts, etc.

That they will ever supplant these latter entirely is open to doubt, as at present at all events the new machines are of little use at night, in misty weather, or strong winds; but as a supplementary arm for service, perhaps three days out of four, no army will be able to dispense with them without grave disadvantages.

It would be out of place here to discuss the development of this new military unit, whether as a means of communication, reconnaissance, or destruction by discharge of projectiles; but it is necessary to note that in considering strategic problems it will now have to be taken into account that geographical features, hitherto looked upon as screens to military movements, cannot always be relied on as such to the same extent in the future, and measures will have to be adopted by each opposing commander to prevent the enemy's aeronautical machines reconnoitring his strength and dispositions.

NAVAL FUEL

(Map XIX)

Even with the matter of fuel for working marine engines we have a new factor to deal with. Coal no longer holds the monopoly for this purpose, and there is every prospect of oil fuel being to a great extent substituted for it. It is necessary, therefore, to consider briefly how naval supplies of oil are to be obtained both in peace and in war. Presumably, should oil be adopted in the British Navy, storage-tanks for oil will be kept at all defended coaling-stations and oil sent there in tank steamers; but the latter will be open to interference in time of war, and the nearer the source of the oil supply is to these stations the better.

In the United Kingdom the chief source of supply would be from Scotland, but if oil was more largely used it is doubtful if this supply would be sufficient; it would probably have to be augmented by oil from abroad. About 95 per cent. of the petroleum produced in the world at present comes from foreign countries. The following percentages will give a fair idea of the amount of general production:

United States	64·00	per cent.
Russia	22·00	,,
Galicia	4·50	,,
Roumania	3·00	,,
Mexico	1·25	,,
India	2·00	,,
Canada	0·20	,,
Borneo	3·00	,,
Scotland and other places . .	0·05	,,
Total . .	100·00	

It is probable, therefore, that Burmah and the United States would be our chief sources of supply in war time, and Burmah is geographically well placed for our Eastern requirements. There is every reason to believe that Egypt will also prove a good source of supply, and the source being close to the shores of the Red Sea is particularly well placed on the route to the East. There are also good prospects of a fruitful source of supply both in Australia and New Zealand, so that our resources in this direction have excellent prospects.

As far as coal is concerned, a glance at the map (No. XIX.) will show that Great Britain has little to fear in this direction compared to any other country.

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